11TH MEETING OF INTER-REGIONAL COOPERATIVE RESEARCH NETWORK ON COTTON FOR THE MEDITERRANEAN AND MIDDLE EAST REGIONS

Abstracts

November 05-07, 2012

Antalya

Turkey

ICAC

International Organization Committee

* Prof. Dr. Oktay Gençer
  General Coordinator of the Network
* Dr. M. Rafiq Chaudhry
  Head of the Technical Information Section of ICAC
* Prof. Dr. Aynur Gürel
  Head of the Breeding and Biotechnology Group
* Prof. Dr. Malgorzata Matusiak
  Head of the Technology Group
* Dr. Michel Cretenet
  Head of the Agronomy Group
* Dr. Michel Fok
  Head of the Economy Group
* Dr. Yaşar Akışcan
  Secretary of the Network Meeting

National Organization Committee

* Prof. Dr. Oktay Gençer
* Prof. Dr. Aynur Gürel
* Dr. Yaşar Akışcan
* Assoc. Prof. Dr. Sema Başbağ
* Assist. Prof. Dr. Remzi Ekinci
* Mr. Mustafa Yaşar

Hotel Information

Conference hotel : IC Hotels Green Palace (5*)
Distance from the Airport : 15 km
Distance to the city centre : 25 km
Adress : Kundu 07110, Antalya, TURKEY
Web Site : http://www.ichotels.com.tr

Progress in GM cotton development in public sector

Yusuf Zafar

Director General, Agriculture & Biotechnology Division
PAEC, Islamabad, Pakistan
y_zafar@yahoo.com
Minister (Technical), Permanent Mission of Pakistan to the IAEA
Hofzeile 13, A-1190 Vienna, Austria.

Abstract

Nearly two third of cotton produced globally is GM in nature. All top six producing countries (Australia, Brazil, China, India, Pakistan and USA) have officially adopted GM cotton which is being grown safely and successfully for the last 10 – 15 years.

Almost all the biotech cotton being grown commercially has been developed by private sector. The public sector have strong R&D programmes on developing GM cotton for various traits like resistant to pathogens and various abiotic stresses, enhancement of quality (oil) and fiber improvement. Though none of these endeavors yet reached to commercialization. However, these efforts will be further strengthen now by availability of complete genome of diploid cotton (Gossypium rhamondii)) having DD genome. It is expected that sequence of tetraploid cotton (AADD) and other diploid cotton (AA) will soon be available in public data base. Majority of ESTs of cotton are already in use by the biotech researchers. All these activities will be reviewed with special reference to cotton biotech programme of Pakistan which is being carried out in public sector.

The issues of patent and bio-safety aspects which are tightly related to GM crop are two major impediments to the commercialization of Biotech cotton. Therefore, out of nearly 80 cotton growing countries there are still only 11 countries where system is in place to grow GM crops. These issues will also be highlighted.

Keywords: *GM Cotton, Pakistan*

Cotton Situation in Greece

E. Tsaliki, A.Kalivas

Hellenic Agricultural Organisation – DEMETER
Cotton and Industrial Plants Institute PO Box 60406
Post code 57001 Thermi Thessaloniki Greece
Tel: 0030-2310-471544, e-mail: dir.cotton@nagref.gr

Abstract

The cultivated area in Greece fluctuates last years among 250000 – 300000 ha and the average seedcotton yield is 2500kg/ha. 10.0% of Greece's total agricultural production is cotton and around 76% of the EU's total output is grown in Greece.

Cotton sector is characterized by small size farms (4.5ha) where cotton cultivation is fully mechanized. All the governmental measures in compliance with EU rules, are focused on Integrated Crop Management from sowing to collecting and ginning including pest and weed control.

At the processing level, a total of 70 private and co-operatives ginneries convert the raw cotton to fiber. The Cotton Standardization Centre of Karditsa which belongs to the Cotton and Industrial Plants Institute is established the last two years in order to classify the producing Greek cotton bales with accredited HVI equipment.

The current regulatory framework from the Common Agricultural Policy, with the direct and attached support for cotton and other crops, was due to expire at the end of 2012, but extended for one more year until the end of 2013, because there is a significant delay in the negotiations at European level. Nevertheless the subsidies, cotton research in Greece, is targeted to improve cotton competitiveness either by increasing yields and reducing cost or by improving the product’s performance to increase market share.

Keywords: *Cotton, Greece*

Turkey Cotton Report

Huseyin BASAL[1] and Volkan SEZENER[2]

[1)] Adnan Menderes University, Agriculturel Faculty, Field Crop Department, Aydin/Turkey
[2)] Nazilli Cotton Research Station, Nazilli-Aydın/Turkey

Abstract

World cotton area and production is estimated 35.8 million hectares and 26.7 million tons in 2011/12. With 641 000 tons cotton production at 475 000 hectares, Turkey is the eight largest producer in the world. The average yield in 2011/12 is expected to be 1350 Kg ha^{-1}. However, it was estimated that Turkey imports a total of 480 000 tons of cotton in 2011, of which 363 772 ton or 82 % was US cotton. The cotton is produced in three major areas, in descending order the Southeastern Anatolia (GAP), Aegean, Cukurova. With the expansion of irrigation area to 1.04 million hectares by 2014, cotton planting and production area would be increase in the GAP region, accounted for 300 000 hectares planting area and over 500 000 tons cotton production. The textile industry is one of the most important and dynamic sectors in the Turkish economy accounting for 8 percent of its GDP, 16 percent of its total industrial production and about 10 percent of its manufacturing jobs. During last decade private sector had significant role for cotton seed production and improvement of new cotton varieties. The ratio of cotton seed production by private sector jumped from %19 to %100 between 2001 and 2011.

Keywords: *Cotton, Turkey*

Status of Organic Cotton Production in Turkey

Ülfet ERDAL[1], Aynur GÜREL[2]

[1]International Agricultural Research and Training Center Menemen-Izmir/Turkey
[2]Ege University, Engineering Faculty, Bioengineering Department, Bornova-Izmir/Turkey

Abstract

Cotton production has been improved in respect to amount and quality with contributions of scientific and technological innovations. Increased sensitivity to health and environmental issues has caused development of new subjects such as organic agriculture. Organic production systems are based on specific standards that combine tradition, innovation and science. It sustains human and animal health and maintains ecosystem and soil quality. Organic agriculture stops the use of pesticides and nutrient pollution.

Turkey has a good knowledge on organic farming and is one of the leading countries in this regard. Organic cotton is grown in 23 countries around the World. India, Syria and Turkey in can be seen in the rank of the countries related with organic cotton production in 2011. Textile Exchange Organic Cotton Farm and Fiber Report in 2011 announced that organic cotton production increased 15 percent from 209.950 metric tons (MT) in 2008 - 09 to 241.276 MT (1.1 million bales) grown on 461.000 hectares (1.14 million acres) in 2009 - 2010 in the world. Organic cotton now represents approximately 1.1 percent of global cotton production. In the future, it is anticipated that demand for organic cotton fiber will be greater than supply. Organic cotton is considered as a niche product or niche-market product up to now, but textile sector relevant to organic cotton with the effects of consumer awareness is start to move from a niche market to mainstream with contributions of many clothing companies.

In Turkey, organic cotton production faced with fluctuations from year to year due to several difficulties such as pest and disease intensity, marketing and contracting problems, demand and supply balance, etc. Taking into consideration demands of producers and consumers of cotton and also textile manufacturers, several product types including organic and also natural colored cottons have to be created in order to provide progress in this field.

Keywords: *Organic Cotton, Turkey*

Identification of QTLs for Cotton Fiber Quality in a M5 Mutant Segregating Population

Bilyana Ivanova, Bojin Bojinov

Agricultural University of Plovdiv, bojinov@au-plovdiv.bg

Abstract

A segregating mutant population has been developed from the standard Bulgarian variety “Chirpan 603” for identification of QTLs related to fiber quality characteristics. SSR markers developed in interspecific crosses and further confirmed in intraspecific crosses, together with in-house developed ISSR markers were used for association mapping of fiber strength, length, uniformity, micronare and elongation. QTLs were identified with major effect on all traits with the ones related to fiber strength, uniformity and micronaire co-localizing on the same region of one linkage group.

Keywords: *Cotton, Gossypium hirsutum, mutation, QTL, mapping*

Characterization of *PROFILIN* Genes From Allotetraploid (*Gossypium hirsutum*) Cotton and Its Diploid Progenitors and Expression Analysis in Cotton Genotypes Differing in Fiber Characteristics

Apostolos Kalivas[1], Anagnostis Argiriou[2], Georgios Michailidis[3] and Athanasios Tsaftaris[2]

[1] Hellenic Agricultural Organisation – DEMETER, Cotton and Industrial Plants Institute, PO Box 60406, Post code 57001 Thermi Thessaloniki Greece, Tel: 0030-2310-471544, e-mail: dir.cotton@nagref.gr
[2] Institute of Agrobiotechnology, Center for Research and Technology Hellas, 6th Km Charilaou Thermi Road, Thermi GR-570 01, Greece. tsaft@certh.gr
[3] Laboratory of Physiology of Reproduction of Farm Animals, Department of Animal Production, School of Agriculture, Aristotle University of Thessaloniki, 54124 Thessaloniki, Greece. michageo@agro.auth.gr

Abstract

The actin-binding protein profilin (PRF) plays an important role in cell growth and expansion by regulating the organization of the actin filaments. Recent studies have reported association between fiber elongation in cultivated cotton (*Gossypium hirsutum*) and PRF expression. In the present study, we cloned four genomic clones from allotetraploid cotton (*G. hirsutum*) and its putative diploid progenitors (*G. arboreum* and *G. raimondii*) designated *GhPRF1_A*, *GhPRF1_D*, *GaPRF1*, and *GrPRF1* encoding cotton PRF and characterized their genomic structure, phylogenetic relationships and promoter structure. Sequence analysis of the coding regions of all clones resulted in a single protein product which revealed more than 80% similarity to most plant PRFs and a typical organization with an actin-binding and a polybasic phospholipid binding motif at the carboxy terminus. DNA blot hybridization suggested that *PRF* gene is present with more than one copy in the allotetraploid species *G. hirsutum*. Expression analysis performed in various organs of cultivated cotton revealed that the *PRF* gene was preferentially expressed in cotton fibers. Very low levels of expression were observed in whole flowers, while PRF transcripts were not detected in other organs examined. Furthermore, higher levels of expression were observed at the early stages of cotton fiber development (at 10 days post anthesis), indicative that this gene may play a major role in the early stages of cotton fiber development. Quantitation of the expression by real-time PCR revealed higher expression levels in a *G. hirsutum* variety with higher fiber percentage compared to a variety with lower percentage. In addition, higher levels of expression were found in cultivated allotetraploid *G. barbadense* cotton species with higher fiber length in comparison to cultivated allotetraploid *G. hirsutum*.

Key words: *PROFILI, Cotton*

Determination of Heterotic Effects of Seed Cotton Weight Per Boll in F_1 Hybrids of Double Cross in Cotton

Remzi EKİNCİ[1], Sema BAŞBAĞ[1], Oktay GENÇER[2]

[1] Dicle Üniversitesi Ziraat Fakültesi Tarla Bitkileri Bölümü
[2] Çukurova Üniversitesi Ziraat Fakültesi Tarla Bitkileri Bölümü

Abstract

Double-crosses, compared to the single-mulattos, a larger wealth of genetic terms (diversity) have, where they are ecologically wider spans, more adaptable to environmental conditions, in other words the general adaptation to the environment (adaptation) are the ability to cause a high particularly in the textile industry overcome many problems that may occur with a mixture of varieties increases the likelihood of success.

This study was carried out in order to determine the heterotik effects of investigated properties in the population which created from 45 double cross F_1 generation, using the double cross breeding method, in Diyarbakır ecological conditions in 2010. The trials are conducted as complete block design (RCBD) with three replications. In the study seed cotton weight per boll was studied.

Twenty hybrid cotton combination had positive and high values heterobeltiosis in terms of cotton weight per boll were determined as promising and future studies that need to be taken into consideration in this hybrid combinations.

Keywords: *Cotton, Double Cross, Heterosis, Heterobeltiosis*

Phule Anmol : *G. Arboreum* Genotype Released For Quality Fibre Introgresed From *G. Anomalum*

R. W. Bharud

All India Coordinated Cotton Improvement Project, Mahatma Phule Krishi Vidyapeeth, Rahuri-413 722. (Maharashtra), India
E-mail: raosaheb.bharud@gmail.com

Abstract

After introduction of Bt hybrids, the area under diploid cotton is consistently decreased. However, under rainfed condition and in marginal soils, the performance of Bt hybrids is not consistent. Suitability for rainfed conditions, low cost of cultivation and resistant to biotic and abiotic stresses are the advantages of the diploid cotton varieties. Looking to these advantages, the area under diploid cotton is again increasing. In *Khandesh* region of Maharashtra, there is a large coverage under Y-1, JLA-794 and some of the private sector varieties. As the fibre qualities of these varieties were found to be low as compared to American cotton, work of developing *G. arboreum* variety with superior fibre properties at Cotton Improvement project, MPKV, Rahuri was initiated.

The wild species *Gossypium anomalum* L. is having high fibre length, fineness, strength and maturity alongwith resistance to jassids, mites, bollworms, rust, bacterial blight and CLCV. To introgress these characters into cultivated *G. arboreum*, efforts were made by crossing and as a result of this, the strain Phule Anmol was developed under TMC projects and tested in TMC trials at different locations as well as MLT in AICCIP trials. The overall mean performance indicated that this genotype recorded 21.16 per cent higher seed cotton yield (1305 kg/ha) than the check JLA-794 (1077 kg/ha). The Phule Anmol was adjudged as the best entry in the trials conducted at 10 locations in respect of fibre length and strength. This genotype was found promising for fibre length (27.7 mm), strength (22.8 g/tex) and Micronnaire value (5.0). These fibre properties are in comparable with the existing *G. hirsutum* genotypes. In the recently held Joint Agresco meet of four SAUs in Maharashtra during 29 -31 May, 2011, this variety has been released for general cultivation in the Western Maharashtra for specific fibre properties.

Keywords: *Gossypium anomalum* L., fibre properties.

Recent Developments in Cotton Breeding and Biotechnology Fields in Turkey

Aynur GÜREL[1] , Volkan SEZENER[2]

[1]Ege University, Engineering Faculty, Bioengineering Department, Bornova-Izmir/Turkey, [2]Nazilli Cotton Research Station, Nazilli-Aydın/Turkey

Abstract

Cotton is a culture plant that has an important place in agriculture, industry and trade both in Turkey and the World. Turkey, one of the leading countries in the world both in terms of textile industry and cotton processing capacity, provides various textile products to world markets.

The traditional cotton breeding studies in Turkey first started with the introduction materials obtained from USA in 1927 and then the selection studies were continued by using these plant materials. Cotton breeding studies gained acceleration in 1960s. There are 123 cotton varieties in Turkey registered primarily by research institutes, private companies and universities using introduction, selection and crossing breeding methods.

Cotton biotechnology studies including tissue culture and molecular genetics have been conducted for nearly the past 15 years in Turkey. Plant tissue culture researches were started in 1960s in our country and private companies that had permission of tissue culture production have preferred to work on crops other than cotton. Universities have taken the lead in tissue culture studies in cotton and also leaded the establishment of infrastructures of research institutes and centers. Researches still continue to provide regenerations through embryogenesis and organogenesis for obtaining the complete plants using cell, tissue and organ cultures in cotton, to select somaclonal variants resistant to different types of abiotic stresses (mainly salinity, drought, etc.) and biotic stress factors such as *Verticillium dahliae* Kleb., and to produce haploid and doubled haploid plants.

Especially in the last 10 years, the number of researches has been quite increased on characterization of cotton species using DNA markers by molecular methods and mapping the genes that are effective on fiber quality and controlling the resistance to Verticillium wilt in cotton genome. The universities also have leaded the molecular genetic researches on cotton and therefore with their contributions, necessary infrastructures have been started to establish in public research institutions, centers as well as private companies.

Although the size of cultivation areas of transgenic cotton varieties, which are biotechnology products, has increased throughout the world, they are not allowed to be grown in Turkey due to the current biosafety law. However, some transgenic varieties were tested in field experiments under controlled conditions in research institutes. Cotton researchers which have high knowledge continue to conduct successful studies for developing cotton genotypes with better yield and fiber quality and, also resistant to biotic and abiotic stress factors in order to meet the demands of producers, textile suppliers and consumers by integrating conventional and modern biotechnology techniques.

Keywords: *Cotton, breeding, recent developments*

Effect of Drought Stress on Leaf Area in Cotton (*Gossypium hirsutum* L.)

*Cetin Karademir, *Emine Karademir, **Osman Çopur, ***Oktay Gençer

* : GAP International Agricultural Research and Training Center, Diyarbakır, Turkey
**: Harran University, Faculty of Agriculture, Department of Field Crop, Sanliurfa, Turkey
***: Çukurova University, Faculty of Agriculture, Department of Field Crop, Adana, Turkey

Abstract

The objective of this study was to determine the effect of drought stress on cotton leaf area characteristic. The experiment was carried out at the GAP International Agricultural Research and Training Center in 2010 cotton growing season with the aim of evaluating 12 cotton genotypes for leaf area development under irrigated and water stress conditions. The experiment was laid out as a randomized split block design with four replications. Significant differences were observed among genotypes, treatments and genotypes x treatments interaction for leaf area. The mean leaf area of genotypes changed from 67.15 to 82.02 cm^2, mean of control was 84.82 cm^2, while the mean of water stress treatment was 62.59 cm^2. The result of this study indicated that leaf area significantly decreased under drought stress condition.

Keywords: *Cotton, drought Stress, leaf area*

Effect of Heat Stress on Leaf Area in Cotton (*Gossypium hirsutum* L.)

*Emine Karademir, *Çetin Karademir, **Oktay Gençer

* : GAP International Agricultural Research and Training Center, Diyarbakır, Turkey
**: Çukurova University, Faculty of Agriculture, Department of Field Crop, Adana, Turkey

Abstract

The objective of this study was to determine the effect of heat stress on cotton leaf area characteristic under field condition. The experiment was carried out at the GAP International Agricultural Research and Training Center in 2010 cotton growing season with the aim of evaluating 15 cotton genotypes for leaf area development under heat stress conditions. The experiment was laid out as a randomized complete block design with four replications. The mean leaf area of genotypes changed from 56.05 to 96.93 cm^2. The result of the study showed that there were significant differences among genotypes for leaf area characteristic.

Keywords: *Cotton, heat stress, leaf area*

Estimation of Combining Ability Effects for Resistance to *Verticillium* Wilt (*Verticillium dahliae* Kleb.), Earliness and Seed Cotton Yield in Upland Cotton

*Yaşar AKIŞCAN, **Oktay GENÇER

*Mustafa Kemal University, Faculty of Agriculture, Department of Field Crops, Hatay/ Turkey
**Çukurova University, Faculty of Agriculture, Department of Field Crops, Adana / Turkey

Abstract

This study was carried out to investigate the genetic mechanisms for resistance to *Verticillium* wilt (*Verticillium dahliae* Kleb.), earliness and seed cotton yield at the six parent lines of cotton (*Gossypium hirsutum* L.), VD-4, PAUM-15, Çukurova 1518, VD-18, Stoneville 468, Nazilli 84S, were crossed in all possible combinations according to the half-diallel mating design, in the years of 2008-2009. Combining ability analysis of the data revealed that general combining ability effects were highly significant ($P \leq 0.01$) for resistance to *Verticillium* wilt, earliness and seed cotton yield. The general combining ability (GCA) variances were greater than specific combining ability (SCA) variances for resistance to *Verticillium* wilt and earliness, which showed the predominance of additive gene effects. SCA variance was greater than GCA variance for seed cotton yield and this showed the predominance of non-additive gene effects. Among the six parents, Stoneville 468 for resistance to *Verticillium* wilt, Çukurova 1518 for yield and PAUM-15 and Nazilli 84S for earliness appeared to be the best general combiners. Among the fifteen cross combinations, 12 for resistance to *Verticillium* wilt, 2 for earliness and 7 for seed cotton yield was found best specific combiner.

Keywords: *Cotton, combining ability, Verticillium wilt, earliness, yield, diallel crossing design.*

Performance of New Bulgarian and Foreign Cotton Varieties

Ana Stoilova, Neli Valkova

Field Crops Institute – Chirpan, Bulgaria

Abstract

The aim was to study the performance of new Bulgarian and foreign cotton varieties at the conditions of Bulgaria. Eleven Bulgarian varieties - Chirpan-539, Beli Iskar, Veno, Trakia, Helius, Avangard-264, Perla, Vega, Natalia, Darmi and Colorit, four Turkish – Nazily-84/5, Nazily-663, Nazily-954 and Barut-2005, and one Macedonian - 5140 were included in a trial carried out in 2008-2010 in 4 replications and harvested plot of 20 m^2, with sowing design 60×10×1. The varieties had the highest degree of influence in the total variation for the September yield and boll weight. Other traits were influenced more strongly by the year conditions. The varieties had different reactions to the year conditions for all characters. Based on the average data, for the conditions of Bulgaria, the varieties Darmi, Helius and Natalia were the best. The variety Darmi in seed cotton yield (2519 kg/ha) exceeded the standard Chirpan-539 by 9.2%, Helius surpassed it by 6.9%, Natalia - by 7.6%. Darmi and Natalia had a longer fiber. The Macedonian variety 5140 at our conditions in seed cotton yield and fiber length was equal with the standard. Great lateness in maturity of Turkish varieties and their lower yields, makes them unsuitable for direct use in the cotton production. However, they have long fiber, high lint percentage and big bolls and set up higher their fruiting branches, which makes them very valuable for the cotton breeding in our country. The different behavior of Bulgarian and foreign varieties in 2010 compared to the previous two years has reflected on their clustering.

Keywords: *Cotton, Varieties, G. hirsutum L., Economic characters*

Productivity and economic effect for cotton cultivated under different inter-row space and irrigation rate

Ivan Saldzhiev*, Angelina Muhova**,

Institute for field crops – 6200, Chirpan, Bulgaia
*E- mail: isald@dbv.bg, **E- mail: angelinajeleva@abv.bg

Abstract

During in the last decades was increased the deficit and grow up the value of irrigated water. In this situation is necessary that steps should be taken to reduce of cotton irrigation depth, with a view to receiving to a high effect from unit of irrigated water and unit of area.

Field trial on cotton (Vega cultivar) was carried out during 2007-2011 on leached vertisols under irrigation regime of sprinkling – 75 % of the field moisture capacity (FMC) for the soil layer of 0 – 40 cm. The trial included the following variants: factor A) Irrigation with lower rates:1). Single irrigation of 600 mm/ha at the interphase period blooming-boll formations; 2). Two irrigations of 450 mm/ha – the first one at the blooming stage and the second – at the boll formations period; 3).Two irrigations of 600 mm/ha – the first one at the blooming and the secon – at the boll formations period; 4). Non-irrigated variant – for standard. Factor B) Width of inter-row space: 1). 60 cm. 2).80 cm.

It was established that the best results were obtained at the variant where cotton cultivated of 80 cm inter-row space and with second time irrigation with 600mm - with 939 kg/ha more that non-irrigated control and with 11.9 % more then variant with irrigated norm 600 mm/ha. In reference of net profit of 1000 m3 irrigated water the best results were realized after single irrigation norm of 600 mm/ha.

In respect of width of inter-row space the yield from a unit of area with inter-row space 0.80 cm we receive with 4.6 % more then sowing of 0.60 cm inter-row space.

Keywords: *Cotton, irrigation rate, inter-row space, water deficit, cotton yield.*

The role of entomofauna in the cotton's agrocenosis

Stefan Rashev[1], Yanko Dimitrov[2]

[1] Field Crops Institute – Chirpan, Bulgaria
[2]Agricultural University – Plovdiv, Bulgaria

Abstract

Studies were conducted in 2009 – 2011 in the field of the Field Crops Institute – Chirpan. The species composition of enemies inhabiting cotton and aphidophag agrocenosis, found standard entomological methods – visual observations, soil excavation, route surveys, moving with a bag and entomological laboratory definitions. The investigation conducted during the periods: outside the growing season of cotton; stage of germination to flowering stage of cotton and flowering stage to maturity stage of cotton.

In cotton agrocenosis established forty-six species: from which thirty-two are harmful insects and mites belonging to seven orders: Coleoptera, Heteroptera, Hemiptera, Thysanoptera, Trombidiformes, Lepidoptera and Orthoptera and seventeen families: *Elateridae, Tenebrionidae, Chrysomelidae, Curculionidae, Coccinellidae, Pentatomidae, Aphididae, Miridae, Cicadellidae, Membracidae, Thripidae, Tetranychidae, Noctuidae, Pyralidae, Gelechiidae, Acrididae* and *Tettigoniidae* and fourteen are beneficial insects belonging to five orders: Coleoptera, Heteroptera, Neuroptera, Diptera and Hymenoptera and five families: *Coccinellidae, Nabidae, Chrysopidae, Syrphidae* and *Aphidiidae*.

Survey entomofauna in cotton agrocenosis will help to develop good plant protection practice. Protection of cotton pests a prerequisite for increasing interest in its cultivation.

Keywords: *Entomofauna, Cotton, Good plant protection practice.*

Photosynthesic Performance of New Bulgarian Cotton (*Gossipium hirsutum*) Varieties

Minka Koleva, Andon Vasilev, Ana Stoilova, Neli Valkova

Abstract

Changes of functional activity of photosynthetic apparatus of new Bulgarian cotton cultivars under water stress are studied. The genotypes were cultivated under field conditions during 2012 at the Field Crops Institute in Chirpan. The chlorophyll fluorescence in dark adapted and light adapted leaves during flowering-boll formation stage was measured with a portable chlorophyll Fluorometer - MINI-PAM –WALZ-GmbH – Germany.

Keywords: *Cotton - Chlorophyll fluorescence – Water stress*

The Antioxidant Potential: Factor of Abiotic Stress Tolerance in Cotton

A. Edreva[1], A. Gurel[2], L.Yildiz-Aktas[3], S.Dagnon[4], B.Yagmur[5], H.Hakerlerler[5], V.Velikova[1], T. Tsonev[1], E. Gesheva[1], B.Izci[6], Y.Oren[7], H.Akdemir[8]

[1]Institute of Plant Physiology and Genetics, Bulgarian Academy of Sciences, 1113 Sofia, Bulgaria, [2]Ege University, Engineering Faculty, Bioengineering Dep., 35100 Bornova-Izmir, Turkey, [3]Ege University, Science Faculty, Biology Department, 35100 Bornova-Izmir, Turkey, [4]Plovdiv University, 4000 Plovdiv, Bulgaria, [5]Ege University, Agriculture Faculty, Soil and Plant Nutrition Dep., 35100 Bornova-Izmir, Turkey, [6]Çanakkale Onsekiz Mart University, Agriculture Faculty, Field Crops Dep., Çanakkale, Turkey, [7]Tariş Figs, Raisins, Cotton and Oil Seeds Agricultural Sales Cooperatives Unions, 35100 Bornova-Izmir, Turkey, [8]Ege University, Ödemiş Vocational Training School, Ödemiş-Izmir, Turkey

Abstract

Two cotton – abiotic stress factors systems have been investigated: cotton – K/Na imbalance (caused by deficiency of K in the soil and over accumulation of Na in the leaves), phenotypically expressed as leaf reddening, and cotton – water shortage causing drought. Both stress factors are inducers of a state of oxidative stress. To counteract it cotton plants deploy the antioxidant potential by triggering various mechanisms.

Regarding the first system, in stress-free conditions plants synthesize the anthocyanidin malvidin (with mono hydroxy- substituted B-ring), whereas in stress conditions (reddening) the synthesis of anthocyanidins is intensified and shifted to another molecule, cyanidin (having o-dihydroxy-substituted B-ring). This structural difference namely determines the higher antioxidant activity of cyanidin as compared to malvidin, finally contributing to the better antioxidant performance of the red leaves.

In overcoming drought stress cotton plants utilize other components of the antioxidant pool. Upon water shortage drought tolerant cotton genotypes maintain higher levels of carotenoids, proline and polyphenols, including flavonoids, as compared to sensitive genotypes. Moreover, they possess a higher ratio of quercetin to kaempferol aglycons, the quercetin being distinguished by a stronger antioxidant activity due to the specific hydroxylation pattern of the B-ring.

Thus the conclusion can be drawn that cotton plants employ an effective versatile network of antioxidant compounds for defense against various abiotic stress constraints. The data obtained contribute to the understanding of the biochemical bases of abiotic stress tolerance in plants, and can serve as a rationale in modeling and engineering stress tolerant cotton crops.

Keywords: *Cotton, Stress, Antioxidant Potential*

Determination of Some Fertility Properties of Cotton Soils in the Antalya Region

İbrahim ÇELİK, Metin Durmuş ÇETİN

Batı Akdeniz Tarımsal Araştırma Enstitüsü Müdürlüğü
metindcetin@hotmail.com

Abstract

This study was carried out to determine the characteristics of some soil productivity in the Antalya region where cotton grown. For this purpose, 78 units in 2000, 36 units in 2002, total 114 soil samples were taken from different places where cotton growing areas in Antalya and around. The soil pH, lime (CaCO3), electrical conductivity, texture, organic matter, phosphorus (P) and potassium (K) were analyzed. According to the survey, structure of the soils showed variety from sandy loam to clay loam. Soil pH is usually slightly alkaline and alkaline, and often no salinity. Determined that the majority of soils to become very high and extremely calcareous besides organic matter content was low level. Amounts of soil available P and K levels ranging was found from low level to very high level.

Keywords: *Mediterranean region, cotton, nutritional status, soil fertility.*

Evaluation of Germination Ability of Cotton Cultivars under Artificial Stress Conditions (*Gossypium hirsutum* L.)

F.P. Xanthopoulos, U.E. Kechagia and E. I. Tsaliki

NAGREF- Cotton and Industrial Plants Institute
57400 Sindos Thessaloniki – Greece

Abstract

Eleven cotton cultivars were evaluated for germination efficiency concerning both, the relevant percentage and the germination rates. Seeds from the selected cultivars, were placed for seven days, in conditions of increased osmotic pressure achieved by gradually increasing concentrations of polyethylene-glycol solutions.

A differentiation in cultivars behavior concerning the percentage and the germination rate was observed. Among the eleven cultivars tested “HERMES” was the least and “SANDRA” was the most affected concerning the two measured parameters. The remaining cultivars are graded in intermediate order. In all cases the cultivar x polyethylene-glycol interaction was significant.

Keywords: *Cotton, stress,germination*

Effect of drought stress on water use efficiency and leaf temperature of two cotton genotypes

Gülden Deniz ATASOY[1], Özgür TATAR[1], Aynur GÜREL[2], Ana STOILOVA[3], Aglika EDREVA[4]

[1]Ege University, Faculty of Agriculture, Department of Field Crops, Bornova- Izmir, Turkey
[2]Ege University, Faculty of Engineering, Department of Bioengineering, Bornova- Izmir, Turkey
[3]Field Crops Institute, 6200 Chirpan, Bulgaria
[4]Institute of Plant Physiology and Genetics, Bulgarian Academy of Sciences, 1113 Sofia, Bulgaria

Abstract

Even though cotton is known as a drought-tolerant crop, it responds well to sufficient water by producing lint proportional to amounts of irrigation supplied. Especially, three key periods of cotton growth, which are stand establishment, pre-bloom and shortly after boll set should be supplemented with moisture. Severe drought on cotton plants will slow plant development, decrease the size of the bolls and could cause shedding. Stand establishment and pre-bloom irrigations affect mostly the total yield, insufficient water supply following bloom and boll development also affects lint quality. A glasshouse experiment was conducted in Ege University, Faculty of Agriculture, Department of Field Crops to determine the drought tolerance levels of two different cotton genotypes. The genotypes used as plant material were an amphidiploid (Chirpan-433 G.hirsitum x G.sturtii) which is considered to be tolerant to drought, and the variety Chirpan-433 (G.hirsitum). It has been proposed that drought tolerance of amphidiploid is derived from the wild progenitor species G. sturtii. The trial was run in a Randomized Parcel Design with 4 replications. Plants were subjected to two different water regimes: well watered and drought. Drought was applied following to bloom. Total dry weight, leaf temperatures and water use efficiency of the plants were evaluated. Water stress significantly affected total dry weight which was found higher in the amphidiploid for both conditions. In well-watered (control) plants , water use efficiency of the genotype Chirpan-433 has been higher but when water stress conditions are introduced, the amphidiploid genotype showed a better performance. Leaf temperatures were determined for a period of 17 days and they increased with the drought stress at a rate of % 14, 31 for amphidiploid genotype and % 13, 95 for the Chirpan-433. In conclusion, dry matter and water use efficiency values of the amphidiploid were found slightly better for the drought conditions. The tolerance level of the genotype could be supported with the further physiological analyses.

Keywords: C*otton, drought, leaf temperature, water use efficiency*

Incidence of cotton bacterial blight on Sudanese open cotton cultivars in comparison with introduced open and *Bt* cotton cultivars in the Rahad scheme

Eltayeb[1], S.M; Ibrahim, S.[1] and Elbadri, G.A.A. [2]

[1.] Agricultural Research Corporation, Rahad Research Station, Elfau, Sudan.
[2]. Agricultural Research Corporation, Crop Protection Research Centre, Wad Medani, P.O. Box, 126, Sudan.

Abstract

The incidence of bacterial blight (BB) was evaluated in Rahad scheme especially in Blocks 1, 2 and 3 with representative samples from blocks 7 and 8 at the Rahad scheme. The experimental sites at Rahad research station and China Technology Demonstration Centre (Block 4) were included. The survey was conducted in seasons 2006/2007 and season 2011/2012. All our popular cotton cultivars were found to be susceptible to the disease under Rahad conditions at least for block 4. The occurrence of new race or races of the disease in the Rahad scheme is claimed for. Our released cotton varieties have not been evaluated against the disease under Rahad conditions. Disease incidence was 100%, the percent of infected leaves was 71.7, over all disease severity was 2.3 and the percent of infected bolls was 8.0%. In the second survey the disease was only reported in block 4 which was 52.3% for disease incidence, 25.7% for infected leaves, 0.5% for over all disease severity and 0.5% for infected bolls. The Rahad research station reported 97.8% for disease incidence, 56.9 % for infected leaves, 1.1% for over all disease severity and 13.7% for infected bolls. Concerning the introduced cultivars the hybrid cotton cultivar BB incidence was 53.5 and the open pollinated *Bt* cultivar was 86.7 percent of infected plants. 16.7 % and 22.2 % as incidence of infected leaves for Hybrid *Bt* and OPV cultivars respectively. With overall disease severity of 0.2 and .04 as well for the two introduced *Bt* cultivars.

Keywords: *Bacterial blight, cotton, Rahad scheme, Sudan.*

Photosynthetic Efficiency in *G. hirsutum* Cotton Hybrids Under Summer Irrigated Conditions

R. W. Bharud

All India Coordinated Cotton Improvement Project
Mahatma Phule Krishi Vidyapeeth,
Rahuri-413 722, Dist. Ahmednagar(Maharashtra), India
E-mail: raosaheb.bharud@gmail.com

Abstract

A field experiment was carried out to study the photosynthetic efficiency in cotton hybrids (*Gossypium hirsutum* L.) at Cotton Improvement Project, Mahatma Phule Krishi Vidyapeeth, Rahuri, Dist. Ahmednagar (MS). The experiment was laid out in randomized block design (RBD) with three replications and ten hybrids. The physiological basis for differences in seed cotton yield amongst the high and low yielding hybrids was mainly due to the variation in magnitude of the morphological and physiological characters along with yield contributing characters. Higher magnitude of mean values of plant height, leaf area, dry matter production and its partitioning, photosynthetic rate and yield contributing characters are important physiological traits in ideotype for achieving higher productivity in cotton. The cotton hybrids NHH-44, Phule-492, RHH-516, RHH-707 and Ankur-651 were observed to be photosynthetically more efficient thereby resulting in to the higher yield. These hybrids were also found to be superior in respect of photosynthetic rate, stomatal conductance, chlorophyll content, dry matter production and its partitioning.

Keywords: *Cotton, Photosynthetic, efficiency, hybrid*

The Determination Effects of Potassium and Zinc Application to Rate of Photosynthesis, Fiber Yield and Quality on Cotton

Sema BAŞBAĞ[1], Bahar TEKİN[1], Remzi EKİNCİ[1], Mustafa YAŞAR[2] , Yüksel BÖLEK[3]

[1]University of Dicle, Agricultural Faculty, Depertmant of Field Crops, 21280-Diyarbakir-Turkey
[2] Internatıonal Agrıcultural Training Center-Ankara-Turkey
[3]University of Sutcu Imam, Agricultural Faculty, Depertmant of Field Crops, Kahramanmaraş-Turkey

Abstract

In this study was conducted to determine the effects of different potassium and zinc application to rate of photosynthesis and fiber yield and quality of Berke cotton varieties in experimental area of Dicle University Faculty of Agriculture in 2010. Rate of photosynthesis, plant height, number of monopodial and sympodial branches ginning, fiber properties (fiber diameter, fiber length, fiber uniformity, short fiber content, fiber strength, fiber brightness, fiber elasticity), were investigated.

According to the results, for all traits studied doses of potassium×zinc application and interaction were significant. Effects of Potassium×zinc aplications were determined significant to properties of plant height, photosynthesis rate, the number of sympodial branch, boll number, ginning percentage, fiber fineness, fiber brightness, short fiber, the fiber strength. Effects of Potassium aplications were significant to fiber length, fiber uniformity and fiber elasticity; effects of zinc aplications were significant to number of sympodial branch.

Keywords: C*otton, potassium and zinc application, photosynthesis, yield, quality.*

Study of Cotton-Second Crop Rotation in Antalya

İbrahim ÇELİK[1], Metin Durmuş ÇETİN[1], Hüsniye GÜLERYÜZ[2], Önal İNAN[2], Mustafa ÇETİNKAYA[2], Can GEÇKAL[3]

[1]Batı Akdeniz Tarımsal Araştırma Enstitüsü Müdürlüğü
[2]Emekli Mühendis
[3]İl Gıda, Tarım ve Hayvancılık Müdürlüğü, Antalya
Contact: celik_ibrahim@yahoo.com

Abstract

Cotton is cultivated intensely in Southeastern Anatolia, Aegean, Çukurova and Antalya region of Turkey. In these regions cotton growing is made with monoculture or wheat rotation. These caused reduction in cotton yield and increasing soil-born disease and pest density. Cotton farmers who want to improve the efficiency use excessive nitrogenous fertilizer. This situation lead to changes soil physical structure and decreases organic matter of soil. This study aimed determination of the most appropriate crop rotation that planted of cotton after wheat, second crop corn, sesame and soybean in between 1992-1997. This studying results showed that the yield of seed cotton has been found high in rotation of second crop corn, soybean and sesame.

Keywords: *Seed cotton yield, crop rotation, soybean, corn and sesame*

The Effect of Plant Growth Regulators on Seed Cotton (*Gossypium spp.* L.) Yield and Lint Quality under East Mediterranean Climatic Conditions

Lale EFE

Kahramanmaras Sutcu Imam University, Faculty of Agriculture, Field Crops Department, Kahramanmaras/Turkey
lefe@ksu.edu.tr

Abstract

This study was carried out in 2010 under east Mediterranean climatic conditions (in Kahramanmaraş-Turkey) to determine the influence of three plant growth regulators (PGR) on seed cotton yield, yield components and major lint quality properties of four cotton (*Gossypium hirsutum* L.) varities. The study was established according to experimental design of split plots with three replications. Cotton vareties were in main plots, plant growth regulators were in subplots. As plant material cotton varieties of Agdas-3, Agdas-17, Maras-92 (*G. hirsutum* L.) and Agdas-21 (*G. barbadense* L.) were used. Pix (100 cc/da, at the beginning of flowering), Turbonik (75 cc/da at the beginning of flowering + 75 cc/da 10 days after first treatment) and Cytokin (60 cc/da at the beginning of flowering + 60 cc 10 days after first treatment) were used as commercial preparation of plant growth regulators and there were control (untreated) plots.

In the study, plant height (cm), sympodial number, boll number per plant, seed cotton weight per boll (g), seed cotton yield (kg ha^{-1}), ginning outturn (%), 100 seed weight (g), fiber length (mm) (2.5 % S.L.), fiber fineness (micronaire), fiber strength (g/tex), elongation (%), uniformity index (%), reflectance degree (Rd), yellowness (+b), colour grade (CG), short fiber index (SFI) (%), trash area (%) and trash count were investigated. Obtained data were analysed using SAS statistical package and means were compared according to Duncan's multiple comparison test.

Keywords: *Cotton, Gossypium spp. L., plant growth regulators (PGR), seed cotton yield, ginning outturn, lint quality.*

Poster

Comparision of different methods to determine the leaf area index (LAI) of cotton (*Gossypium hirsitum* L.)

Özgür TATAR, Gülden Deniz ATASOY, Uğur ÇAKALOĞULLARI, Emine DURMUŞ

Ege University, Faculty of Agriculture, Department of Field Crops, İzmir-TURKEY

Abstract

The leaf area index is one of the main measurement which is used to carry out the physiological and morphological determinations such as photosynthetic activity, transpiration and some growth parameters in many crops. However, measurments of leaf area in field studies with many leaf samples is time consuming and less reliable to determine photosynthetically active canopy area In this study, some rapid estimation techniques are compared with digital scanning method to determine the leaf area index (LAI) of cotton. The study was carried out during 2012 growing season in the experimental fields of Ege University Faculty of Agriculture Department of Field Crops and Plant Physiology Laboratory. Different canopy structures of cotton are provided with four different sowing dates. LAI was determined by digital scanning, calculation of width-height-coefficient and vertical digital photography. The results indicate that there is a significant positive relationship (R^2=0.956) between scanning technique and the width-height-coefficient method. On the other hand, vertical digital photography is also important to support the other two techniques in terms of determination of the photosynthetically active area, especially when the overlapping leaves in the canopy are considered.

Keywords: *Cotton, leaf area index, digital photography*

Poster

Introduction of Set Tohumculuk A.Ş.

Fehmi Gülyaşar

Adana Hacı Sabancı Organize Sanayi Bölgesi OSB Turgut Özal Bulvarı No:35
01350 Yüreğir / ADANA

Abstract

Set Tohumculuk A.Ş. has been established in January 2010 at Adana Organized Industrial Zone in Turkey. Our goal is to produce cotton seed by using latest Technologies and provide service to the country agriculture.

After integration of Deltapine Inc. to Monsanto in 2007, seed production strength of the company increased, and became World' s largest cotton seed producer.

With the licence agreement between Set Tohumculuk A.Ş.and Monsanto, Deltapine Cotton seed demands of Turkish farmers is provided by our company.

Keywords: *Set Tohumculuk A.Ş*

Poster

Calibrating the Micromat Instrument Using the HVI Output Data

Abeer.S. Arafa and Hanan M. Arafa

Cotton Research Institute, Agricultural Research Center, Giza, Egypt.

Abstract

There is a need for an accurate and rapid method for measuring cotton fiber fineness and maturity characters. The aim of the present investigation was to demonstrate the validity of the micromat instrument calibration by HVI instrument using the standards described by the two values called PL and Ph. 64 specimens were tested and subjected to statistical analysis. The result of T- test, correlation and regression indicated the validity of our calibration.

Comparison of micronaire, and maturity data of the two calibrated micromat and HVI instruments proven that the two instruments were providing statistically similar micronaire data, consequently, PL data. The different of the principle of measuring the maturity ratio did not affect the Ph value in a wide range because the formula of calculated the Ph depends on both of the PL and maturity ratio readings .This indicated the validity of our calibration.

Keywords: *HVI, Micromat*

Poster

Properties of Woven Fabrics Made from Compact, Ring and Open-End Rotor Cotton Yarns

Suzan H. Sanad and M.AM. El-Sayed

Cotton Research Institute, Agricultural Research Center, Giza-Egypt

Abstract

The properties of compact, ring and rotor spun yarns produced in constant count from two Egyptian cotton varieties “Giza 86 and Giza80” were investigated. Yarn samples were converted to woven fabrics to determine the physical performances of the yarns in woven form.

The results revealed that compact spun yarns have higher strength, lower hairiness and unevenness and better pilling resistance over ring and open-end rotor spun yarns. The improvement in yarn strength is greater for compact spun than for ring and open-end rotor yarns. The fiber of the compact yarns was much better aligned with the yarn axis than those of the ring yarn, while open-end yarns recorded the last one.

Furthermore, the spun Giza 86 yarn showed high strength, elongation, evenness, lower neps and hairiness values than the equivalent Giza 80 yarn irrespective of yarn formation, which is due to the higher fiber quality of Giza 86. However, the fabrics consisting of compact yarns exhibited much better pilling performance compared to the fabrics produced by conventional ring and open-end spun yarns. Compact yarns are reported to have higher abrasion resist¬ance than ring and open-end yarns in terms of weight loss.

Keywords: *Cotton, Yarn, Woven Fabrics*

Poster

Combined Effects of Drought and Heat Stress on *Gossypium hirsutum* L. and *Gossypium barbadense* L.

Özgür TATAR[1], Vaclav HEJNAK[2], Jaroslava MARTINKOVA[2]

Ege University Faculty of Agriculture Department of Field Crops, Izmir TURKEY
Czech University of Life Science, Faculty of Agrobiology, Food and Natural Resources, Department of Botany and Plant Physiology, Prague CZECH REPUBLIC

Abstract

Cotton is most widely grown during summer period in arid and semiarid regions where water is limited and high temperature is often restrict productivity. Although drought and heat stress genarally appears simultaneously in field conditions, their spesific effects become more important if irrigation is availble under unfavoruble high temparatures. A comperative study was conducted in a controlled environment to evaluate the effect of drought and heat stress on dry matter pattern of two different cotton genotypes, cv.Giza (*Gossypium barbadense* L.) and cv.Carmen (*Gossypium hirsutum* L.). The completely randomize design was performed with three factors and three replications. Soil water content of plants subjected to drought was 25% of water holding capacity whereas 75% in well watered condition. Atmospheric temparature was increased up to 40°C in a growth chamber while control condition was 25°C. Both drought and heat stress were resulted in a significant decrese in total dry matter production for both cv.Giza and cv.Carmen. However relative reduction in total dry matter of cv.Giza was more pronunced as a result of combined effect of drought and heat stress than cv.Carmen though cv.Giza had better performance under sole drought effect. Spesific effect of heat stress on cv.Giza can be attributed to relatively higer reduction in leaf dry matter in high temparatures.

Keywords: *Cotton, heat stress, drought, Gossypium hirsutum L. and Gossypium barbadense* L.

Bt cotton adoption and variety market development: The Chinese case

Naiyin XU[1] & Michel FOK[2]

[1]Jiangsu Academy of agri. Sciences, Nanjing, China
[2]CIRAD, UR SCA, Montpellier, France

Abstract

In China, Bt-cotton varieties are widely adopted since 1997 to help control attacks of *Helicoverpa armigera*, a major pest on cotton crop. Most studies have related this adoption only to the specific advantages of Bt-cotton, e.g. in terms of reduction in pesticide use. This reason appears not to be sufficient as this specific advantage has been put into question in more recent papers, which also raised the issue of seed prices.

By referring to datasets seldom used in earlier analyses, we argue that Bt-cotton use in China has benefitted a lot from the development of the cotton variety market and it could suffer if this development is not effectively regulated. Since mid-1990s, a favourable legal framework has been set up and it resulted in the development of a competitive variety market. But free-wheel development led to the current stiff competition which is responsible for quality uncertainty and possibly for high seed pricing. The profitability and continued use of Bt-cotton is under threat, as well as the pursuit of the development of the variety market. Actions have been conducted to regulate this market, but their effectiveness is debatable.

Keywords: *Bt cotton, market development, China*

Assessment of Fiber Technological Properties of New Bulgarian and Some Foreign Cotton Varieties with HVI and AFIS

Ana Stoilova[1], Malgozhata Matusiak[2], Neli Valkova[1]

[1]Field Crops Institute – 6200 Chirpan, Bulgaria
[2]Textile Institute – Lodz, Poland

Abstract

The aim of this paper was to study the fiber technological properties of new Bulgarian cotton varieties, resulted from two differently purposeful breeding programs, compared to some foreign ones. In 2008, the fiber technological analysis of studied cotton varieties was made with HVI and AFIS at the Textile Institute in Lodz, Poland, in 2008 and 2009 the fiber properties were measured with HVI at the factory "Yana" in Burgas, Bulgaria. In 2008 the strong and prolongation drought during the period of flowering and boll formation – the second part of July and August, gave strong negative effect on fiber length. 2009 was also hot in temperature supply and dry in rainfall. The phase of flowering and boll formation passed rapidly and this had a very adverse effect on the fiber length, stronger expressed for qualitative varieties having a longer growing season. It was found that in fiber length (26.03-27.80 *mm)* the Bulgarian varieties belong to "middle long fiber cotton" and in micronaire (4.0-4.6 *mic*) they refer to "middle fine cottons". The varieties Avangard-264, Perla, Vega, Colorit, Darmi and Natalia, possessing germpalsm of *G. barbadense L.* species, differed by longer and finer fiber compared to Chirpan-539, Veno, Beli Iskar, Trakia and Helius. All varieties had strong fiber (28.0-29.8 *g/tex)* and very good uniformity (81.0-82.8 %). They had fairly good to very good fiber elongation (8.8-10.1 %). The finest fiber was found for the variety Avangard-264, but it was the strongest for the varieties Darmi, Veno and Trakia.

Keywords: *Cotton, G. hirsutum L., Varieties, Fiber technological properties*

Production of Carded Compact Cotton Yarn of Comparable Quality to The Combed Conventional Ring Yarn

M.A.M. El-Sayed[1], Suzan H. Sanad[1], and H. E. M. Mahmoud[2]

[1]Cotton Research Institute. Agric. Res. Center, Giza, Egypt.
[2]Faculty of Applied Arts, Mansoura Univ.

Abstract

The objective of this study was to determine the influence of cotton type in order to find out if it is possible to produce a carded compact yarn of comparable quality to the combed conventional yarn. Marzoli spinning frame was used to produce combed and carded cotton yarns with linear densities of 14.76 tex (40 Ne), 19.68 tex (30 Ne), and 29.53 tex (20 Ne), with constant twist multiplier 4.0, were manufactured from the same LS cotton (Giza 80 and Giza 90, as Egyptian cotton and MLS, Greece “Upland” cotton. Combing was carried out 18% noils during the combing process. Within the tests carried out, the following quality parameters were analyzed of fiber and yarn quality properties such as single yarn strength, elongation, mass irregularity, yarn faults, and hairiness.

Yarns spun on the Olfil carded compact spinning frame were found to have the following advantages when compared to those spun on the combed ring spinning frame: higher strength and elongation at break, somewhat equivalent or higher yarn unevenness, and a significantly lower number of yarn faults such as thin, thick places and neps, as well as a lower hairiness. This study also revealed that compact spinning could be used for producing coarse and medium yarn counts from 20’s to 40’s, from Long staple Egyptian cotton with comparable quality to the combed conventional ring spun yarns .

Keywords: *Cotton, Quality, Ring Yarn*

The Prediction of Yarn Strength of Cotton Sirospun Yarns from AFIS Fıber Propertıes by Usıng Lınear Regression Analysis

*Tuba BEDEZ UTE, **Huseyin KADOGLU

Ege University Faculty of Engineering, Department of Textile Engineering Bornova- İzmir, Turkey
*Email: tuba.bedez@ege.edu.tr, **Email: huseyin.kadoglu@ege.edu.tr

Abstract

Cotton is one of the strategical agricultural products that have various utilization areas in agricultural, industrial and trade sectors. As the raw material cost constitutes the majority of the yarn production costs, it is critically important to know the desirable fibre characteristics that we need for our yarn characteristics and for the selection of the suitable cotton blend.

Modeling and prediction of the yarn properties has been very attractive for the textile engineers, therefore several mathematical and statistical models have been developed to yield limited success in terms of prediction accuracy and general applicability. These interactions are critically important for the spinners for raw fiber selection.

This paper is part of a work concerning the experimental research and the modeling of the mechanical behavior of the cotton sirospun yarn. For this purpose different cotton blends were selected and their properties were measured with AFIS. Yarn count, twist coefficient and strand spacing were also selected as predictors because of their considerable effects on the yarn properties. In summary, approximately 270 types of sirospun yarns were produced on the same ring spinning machine under the same conditions at Ege University. Linear multiple regression method were used for the estimation of yarn quality characteristics. Statistical evaluation showed that our equations had a large R^2 and adjusted R^2 values.

Keywords: *AFIS, cotton fibre, regression analysis, ring spinning, sirospun yarns, yarn strength.*