



CIRCOT news

Newsletter of the Central Institute for Research on Cotton Technology, Mumbai

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EDITORIAL

The National Policy on Agriculture propounded by the Government of India seeks to actualize the vast untapped growth potential of Indian agriculture to generate income and employment opportunities for the rural community. An annual growth rate of **4%** is envisaged for the agriculture sector during the 10th five year plan in this policy document of the Government. Needless to mention here that, to achieve the projected rate of growth, there is need to make huge investments in agricultural research and extension and improve both the institutional and policy environment. A well coordinated net worked approach among different stakeholders such as producers, traders, processors and consumers in the agricultural value chain would be one of the crucial requirements to bring about the desired change in this sector.

The recently launched, World Bank funded initiative by the Indian Council of Agricultural Research (ICAR), by now popularly known as National Agricultural Innovation Project (NAIP), is a response by the Council to the Policy initiatives of the government in the agriculture sector. NAIP accords high priority to generation and transfer of agricultural technologies and looks for innovations in the system. Today's market-driven agricultural development has to necessarily evolve strategies for enhancing diversification and emphasize on value added production of agricultural commodities.

Under this back drop, NAIP aims to support an accelerated and sustainable transformation of Indian agriculture by promoting income generation and poverty alleviation activities through collaborative development and application of agricultural innovations in a public-private partnership mode. Apart from building the critical capacity of the ICAR as catalyzing agent for management of change in the Indian National Agricultural Research System (NARS), the NAIP proposes to support research activities broadly under three components viz. (i) production to consumption research, (ii) improvement in livelihood security of rural people living in disadvantaged regions through technology-led innovation systems and (iii) basic and strategic research in frontier

areas of agricultural sciences.

Successfully launched by ICAR at the hands of the Hon'ble Union Minister for Agriculture Shri Sharad Pawar, on July 26, 2006, the project has started rolling. During the initial few months following the launch, the project has laid greater emphasis on creating awareness about the programme among stake holders by



organizing zonal workshops and also satellite meets. This was indeed to sensitize and generate interest for seeking wider participation from public institutions outside NARS, private, NGOs and farmers organizations for smooth execution of the envisaged project. At the instance of CIRCOT, an awareness programme was held at Mumbai exclusively for the cotton group on 26th August, 2006 wherein the National Director, NAIP participated and elaborated on the salient features and components of the project. A useful discussion that followed cleared several doubts and comments about the proposed public-private partnership under NAIP.

We at CIRCOT feel that under NAIP a comprehensive value chain programme on cotton should be taken up that would not only link a cost competitive quality fibre production to value addition, textile manufacture and marketing but also devise ways and means to bring byproduct of plant (stalks) and seed into mainstream linking primary processing to entrepreneurship to showcase the competitiveness of this natural fibre crop. Additionally, such a programme would serve as a role model for others in the sector to emulate and reap benefits. This would be one of the surest ways to sustain and compete against the synthetic fibres in the market.

Editorial Committee

**Dr. S. Sreenivasan, Dr. C.D. Ravindran,
Dr. N. Vigneshwaran, Shri V.B. Suryanarayanan
and Shri M. Mohan**

R & D ACTIVITIES

Assessment of lint quality obtained from variable speed double roller gin

This study was undertaken at CIRCOT, by processing long staple cotton Surabhi, medium staple cotton G.Cot.Hy.10 and two short staple cottons, Jaydhar and MECH-23. It was found that the long and extra long staple cottons could be better ginned with higher roller speeds of 130-150 rpm. The productivity in long and extra long staple cottons can be enhanced by 25 to 60% than the standard roller speed. There was no change in the quality of fibres.

Synthesis of Zinc Oxide Nanoparticles using Soluble Starch

Zinc oxide — soluble starch nanocomposites (nano-ZnO) synthesized using water as solvent and soluble starch as stabilizer are impregnated onto cotton fabrics to impart antibacterial and UV-protection properties. Nano-ZnO synthesized by reacting zinc nitrate with sodium hydroxide in the presence of soluble starch absorbed strongly at 361 nm due to quantum confinement effect. The starch content in synthesized nano-ZnO was estimated to be 37.6% using thermo-gravimetric analysis. The average size of ZnO nanoparticles is estimated to be 38 ± 3 nm using TEM and confirmed by X-ray diffraction analysis and effective mass approximation method. A fine-medium weight 100% cotton woven fabric (plain weave; 75.3 g/m²; ends, 75/inch; picks, 60/inch) was used in this study. Nano-ZnO was applied on cotton using 'pad-dry-cure' method. The nano-ZnO impregnated cotton fabrics showed excellent antibacterial activity against two representative bacteria, *Staphylococcus aureus* (Gram positive) and *Klebsiella pneumoniae* (Gram negative).

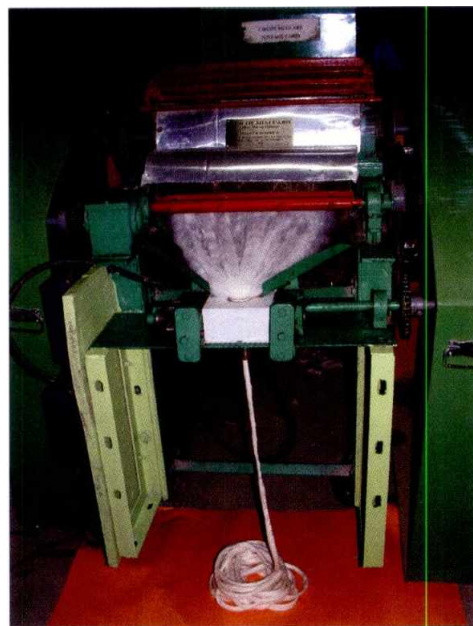
Development of a Low-cost Sliver Making Machine for Value Addition to Cotton at Rural Level

CIRCOT has developed a low cost sliver-making machine, named as CIRCOT Mini Card, which is suitable for sliver production from cotton with 1.8 kg/hr production.

Based on simple design, the machine consists of two detachable units (a) pre-opener and (b) carding including sliver making unit.

The machine is suitable for use at village level. In the cotton growing area, villagers normally use traditional methods for sliver making by using their hands. In this method, the wastage of cotton is more and the quality of sliver is not maintained. In the traditional method, crude comb bars are used for opening cotton, which results in fibre damage and production of poorer quality yarn.

CIRCOT Minicard can be used in conjunction with traditional roving and yarn making machines for production of good quality yarn. Recently, trials have been conducted with the help of an NGO, Varhad Seva Pratishtan, Akola to study its performance in production of cotton sliver. The sliver produced on this carding machine was processed into yarn by conventional method followed in the village. The yarn produced from this sliver was found to be quite satisfactory in quality.



Low Cost Sliver Making Machine

Single Stage Process for Absorbent Cotton

Short staple cotton fibre waste of fibre length less than 15 mm is obtained in mills at various stages of processing. Most of these fibres are coarse and cannot be used for spinning. This can be easily converted into absorbent cotton, which is in good

demand. The standard process followed in the industry is scouring the sample under pressure at 120°C temperature using 1% NaOH for about 4 h. This is followed by bleaching. This process is time consuming and requires lot of energy. The newly developed process carries out scouring and bleaching together in 1 h, and that too at boiling temperature of water, i.e., 100°C thereby saving of energy, time and chemicals. The process developed at the laboratory stage has been scaled upto treating 3 kg sample at a time. Scaling up to pilot plant is the next stage to be done. A patent has been obtained for the CIRCOT process (198339 of 18.1.06).

MEETINGS

Proceedings of the Second Review Meeting on Utilization of Cotton Stalks for Value Added Products

The Second Review Meeting of the CFC funded project was held on 2.5.06 at GTC of CIRCOT, Nagpur under the Chairmanship of Dr. S. Sreenivasan, Director, CIRCOT. Dr. R.H. Balasubramanya, PI and Head, Chemical and Biochemical Processing Division made a brief presentation on the logistics of cotton stalk collection, procurement of machinery and installation. Dr. R.P. Kachru, Former ADG (PE) at the outset expressed appreciation over the installation of all the machinery in the newly constructed building and felt that demonstration of preparation of boards by actual running of the plant would have definitely left a lasting impression amongst the members. Dr. B.M.Khadi, Director, CICR, Nagpur expressed satisfaction over the progress made during the period and informed all the members that as cotton crop of late is becoming non remunerative to farmers due to high cost of cultivation, any effort to provide additional income to the farmers by way of payment for cotton stalks is a welcome initiative. Mr. Sietse van der Werff, Senior Project Manager, CFC informed that Flow chart in appropriate places would help in understanding the process better. Mr. Gebre Medhin, Managing Director, CFC informed that possibility of briquetting the wastes generated during collection and cleaning of cotton stalks be seen and the relationship between energy generation with regard to other natural fibres namely, coir and jute to be also worked

out. There is need to ensure gender equity in emoluments to workers Mr. Medhin pointed out.

Dr. C.N. Pandey, Director, IPIRTI, Bangalore informed that data on Humidity and temperature during collection and storage to be recorded since this affects the percentage of moisture in the chips. Dr. Pitam Chandra, ADG (PE), ICAR remarked that attempts to be made to utilise all the crop residues being renewable sources for board manufacture.

Workshop on Right to Information Act, 2005

A two days workshop on Right to Information Act 2005 was conducted at the Institute during 19-20 May 2006 to sensitize a majority of officials about the Act. About 21 Scientific, 21 Technical and 22 Administrative functionaries attended the Workshop. Senior officers from administration wing of ICAR, legal luminaries and social activists from Mumbai were the resource persons at the Workshop.

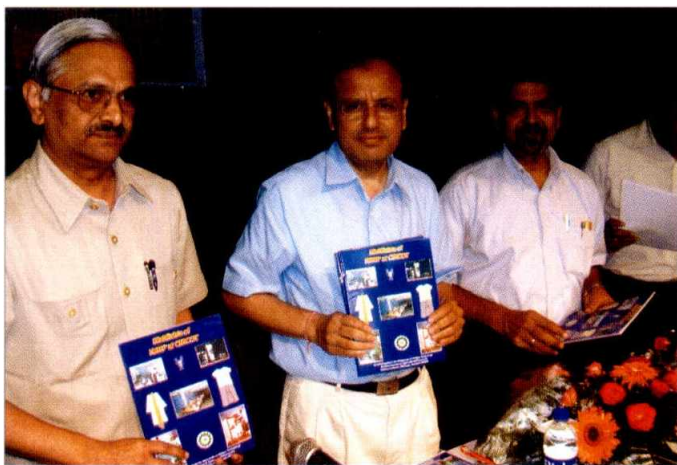


Dignitaries on the dais at the Workshop on Right to Information Act 2005

Sensitization Programme on National Agricultural Innovation Project

A Sensitisation programme on NAIP was held on 26th August 2006 at Jubilee Hall of CIRCOT. Dr. Mruthyunjaya, National Director, NATP presided over this meeting and released the publication "Highlights of NATP at CIRCOT". This was followed by a detailed presentation about the basic concept of NAIP and objectives, concept of consortium, components of NAIP, preparation, evaluation and selection of projects, their monitoring and implementation. Also, the administrative and financial matters of NAIP were discussed in detail. Valuable remarks on NAIP were

made by Dr. Pitam Chandra, ADG(PE), ICAR. While Dr. S. Sreenivasan, Director, CIRCOT made welcome remarks, Dr. K.M. Paralikar, Head, TTD, CIRCOT, proposed a vote of thanks at the end of the meeting.



Dr Mruthyunjaya, National Director NATP releasing the publication "Highlights of NATP at CIRCOT"

Interaction of Dr. Nawab Ali, DDG (Engg.), ICAR with CIRCOT Scientists

This interaction was held on 28th August 2006 at 2.00 pm in the Seminar Hall of CIRCOT. The Impact of CIRCOT's technologies was explained by Dr. S. Sreenivasan followed by a detailed presentation by all Heads of Divisions. The major research and developmental activities in the tenth plan period were discussed followed by the proposed programmes for the eleventh plan. The new areas to be focused in the eleventh plan would include the fabrication of energy efficient delinting machine, production of medium density fiberboard, processing and finishing of blended textiles, effluent treatment process and functional finishing of textiles using nanotechnology.



Nawab Ali, DDG (Engg.), ICAR being welcomed by Dr. S. Sreenivasan, Director CIRCOT

Peer Review of XI Plan Document

A peer review of CIRCOT's XI plan document was held on 4/9/06. This was presided over by Dr. P.R. Roy with the participation of Dr. S. Sreenivasan, Dr. B.M. Khadi, Dr. A. Subramaniam, Dr. V Subramanian, Dr. K.R. Krishna Iyer and Shri. Mahesh Sharma. All Scientists of CIRCOT participated in the meeting. Suggestions given by the experts were included to revise the XI plan document of CIRCOT.



Dr S. Sreenivasan welcoming Dr A. Subramaniam at the Peer Review of XI Plan Document of CIRCOT

Short Course

A Short course on "Recent Advances in Post Harvest Processing, Quality Evaluation and Byproduct Utilization of Cotton" was held during September 13 – 23, 2006. Twelve participants from various universities and research institutions attended this course. Apart from in house faculties, out side experts were also invited to give lectures. This course covered the entire scenario of post harvest processing and quality evaluation of cotton fibres and byproduct utilization of cotton plant.



Participants for the short course on "Recent Advances in Post Harvest Processing, Quality Evaluation and Byproduct Utilization of Cotton"

Lectures

The following lectures were arranged within the Institute during the past six months:

- * "Poly Lactic Acid: An Eco-Friendly Manmade Polymer" by Dr. V.D. Gotmare, VJTI, Mumbai, on September 11, 2006.
- * "Impressions on the International Conference AFINTI" by Dr. R.P. Nachane, Principal Scientist, CIRCOT, on September 11, 2006.

Consultancy & Contract Research Projects

During this period, the consultancy processing cell held 6 meetings. A number of projects were discussed and approved. Through consultancies, the institute earned about Rs.6 lakhs.

PERSONNEL

Promotions

Shri P.G. Patil was promoted as Scientist (Selection Grade) w.e.f. 14.9.2004

Shri S.K. Shukla was promoted as Scientist (Sr. Scale) w.e.f. 15.11.2005

Dr. N. Vigneshwaran was promoted as Scientist (Sr. Scale) w.e.f. 11.03.2006

Transfer

Smt. N.D. Deshmukh U.D.C. was transferred from G.T.C., Nagpur to CIRCOT, Mumbai w.e.f. 20/5/2006

Shri R.D. Shambharkar Stenographer, Gr.III was transferred from CIRCOT, Mumbai to G.T.C., Nagpur w.e.f. 20/5/06

Smt. N.D. Deshmukh U.D.C. was transferred from CIRCOT, Mumbai to G.T.C., Nagpur w.e.f. 31/7/2006

Retirement

Shri B.S. Ganvir, Gr.T-7 retired on 30/4/3006 on Superannuation

Dr. Y. Subrahmanyam, Sr. Scientist retired on 30/9/2006 on Superannuation

Shri S.S. Patekar, Gr. T-5 retired on 30/9/2006 on Superannuation

Training Programmes Attended by Staff

* Dr. N. Vigneshwaran attended the *Fermentation Process Modeling, Optimization and Control: Experimental & Simulation Methods* programme on April 10-15, 2006 at IIT Bombay.

* Shri M.B. Chandanshive, Shri G.G. Ambare, Shri B.K. Sawant and Shri D.G. Gole attended *First Aid Training Programme* on 7,14, 21-5-2006 at First Aid Training Centre, Thane

Shri R.S. Pathare attended *Managerial Skills for Technical Officers* on 22-26 May, 2006 at ISTM, New Delhi

* Dr. K.M. Paralikar, Dr. R.H. Balasubramanya, Shri B.K.Sinha and Smt. M.V. Kamerkar attended *Right to Information Act: Obligations & Strategies* on 5-6 May, 2006 at Industrial Management Academy, Mumbai

* Shri B.K. Sinha, Smt. M.V. Kamerkar, Shri M.Z.Bhagat and Shri K.W.Khamkar attended the Workshop for *Public Information Officers* on 17th June, 2006 at Mumbai Study Circle, Mumbai

* Shri B.K. Sinha attended a Workshop on *Presentation Skills* on 26-27 June, 2006 at ISTM, New Delhi

* Shri B.K. Sinha, Shri R.K.Singh, Shri S.V. Kasabe, Smt. S.D. Ambre and Shri T.D.Dhamange attended *IT Sensitization Training Programme* on 26-30 June, 2006

* Smt. Acushala Antony attended *National Workshop on Artificial Intelligence* on 3-4 July at 2006 CDAC, Mumbai

* Shri Mahabir Singh attended *Sewing Machine Operator Course* w.e.f. 24-7-2006 (3 months) at the Apparel Training & Design Centre, Navi Mumbai

* Shri B.K. Sinha, Smt. M.V. Kamerkar, Shri M.Z.Bhagat and Shri K.W.Khamkar attended the *Workshop for' ublic Information Officer* on 19th August, 2006 at Mumbai Study Circle. Mumbai

- * Shri S. Vancheswaran, Smt. Bindu V. and Shri D.U.Kamble attended the *Workshop on Fabric & Garment Inspection* on 19th Sept. 2006 at S.G.S. Pvt. Ltd., Mumbai

PUBLICATIONS

A. Research papers published in journals

- * N. Vigneshwaran, R.P. Nachane, R.H. Balasubramanya and P.V. Varadarajan, *A novel one-pot 'green' synthesis of stable silver nanoparticles using soluble starch*, **Carbohydrate Research**, **341(12)** (2006) pp.2012-2018.
- * V. Prasad, C.D. Souza, D. Yadav, A.J. Shaikh and N. Vigneshwaran, *Spectroscopic characterization of Zinc Oxide nanorods synthesized by solid-state reaction*, **Spectrochimica Acta Part A** (2006) **65**, pp. 173-178
- * S.B. Jadhav and K.M. Paralikar, *Optimising the Frequency of Oscillating Beater in Double Roller Gin*, **Indian Journal of Fibre and Textile Research**, accepted for publication
- * Achchhelal Yadav, R.P. Nachane and G.F.S. Hussain, *Air Permeability of Different Layers of Woven Fabric*, **Journal of Polymer Materials**, accepted for publication
- * C.D. Ravindran and G.F.S. Hussain, *Influence of Fibre Parameters on Neps in Cotton Lint*, **Journal of Indian Society for Cotton Improvement**, accepted for publication

B. Research papers presented in seminars and conferences

S. Sreenivasan, R.P. Nachane and G.F.S. Hussain, *Air permeability in woven fabrics*, presented at the National Seminar on **Advances in Fibrous Materials, Nonwoven and Technical Textiles**, 7-9 August 2006, Coimbatore

C. Other Publications

- * Booklet on "Highlights of NATP at CIRCOT"
- * Booklet on "Storage of Seed Cotton"

OTHER ACTIVITIES

Hindi Parliament Committee

On **Pt** June 2006, a Sub Committee of Parliament Committee on official language visited Mumbai and inspected the work done in official language by Government departments that included CIRCOT. At that time CIRCOT exhibited technical material on the work done in official language which was appreciated by the Committee.

Hindi Workshop

A Hindi Workshop was organised for the benefit of stenographers and all Division Heads and Administration Section Heads on how to give and take dictation. The period of workshop was for 5 days i.e. from 4th September 06 to 8th September 06. Shri Anant Srimali Assistant Director, Hindi Teaching Scheme took classes. First two days Shri Srimali taught how to give dictation and grammar, spelling etc. Remaining three days actual sessions on dictation to stenographers were conducted.



Smt. Joshi, Hindi Translator introducing Shri Anant Srimali to the participants of the Hindi Workshop

Hindi Day/Fortnight Celebration

The Hindi Day/fortnight was celebrated at the institute between 14th Sept. 06 and 25th Sept. 06 with great enthusiasm. The celebrations were inaugurated by the Chief Guest Dr. (Mrs.) Suman Jain, Principal, SNDT's B.M. Ruia College and Social Worker on 14th Sept.06. In the presence of the Chief Guest two competitions namely "Aashubhashan" and "Kavita Pathan" were held. Dr. R.P. Nachane, Acting Director presented the welcome address.

In the ten days that followed, various competitions like essay-writing, shorthand/ dictation, technical vakyansh, phrases and their uses, poetry composing, cross-word, bees-sawal, poster presentations, antakshari, etc. were conducted. More than 100 staff members took active part in the contests.

The closing day function of the celebrations was presided over by the Chief Guest Dr. (Mrs.) Santosh Kaul, Acting Principal SNTD and Head Hindi Dept. in the presence of Dr. S. Sreenivasan, Director, CIRCOT. Dr. K.M. Paralikar, Chairman, Hindi Day Organising Committee presented a brief account of the competitions carried out in the institute during the ten days. Dr. R.H. Balasubramanya, Rajbhasha Adhikari, read out the proceedings of the various activities carried out done and progress made in implementation of Official Language during the year.



Dr S. Sreenivasan with Dr. U. Vajpayee, Shri Ram Asrey Lal and Smt. A. V. Deshpandey, the judges to the Hindi Poster Presentation programme

Hindi Week Celebration at GTC, Nagpur

The Hindi week was celebrated at the GTC, Nagpur between 14th Sept. 06 and 20th Sept. 06 with great enthusiasm. The Chief Guest Mr. Rakesh Kumar, Sr. Administrative Officer and Special Guest Dr. Mahendra Kumar Shahu, Sr. Hindi Translator, National Bureau of Soil Survey and Land Use Planning inaugurated the celebrations on 14th Sept.06. In the weekdays that followed various competitions like geet gayan, phrases and their uses, essay writing, etc. were conducted. Twenty-three staff members took active part in the contests.

The closing day of the celebrations was presided

over by Dr. Aman Kumar Maji, Director I/c and Dr. Sohan Lal, Principal Scientist, from National Bureau of Soil Survey and Land Use Planning.



Hindi Week Celebrations at GTC, Nagpur

Participation at the 65th Plenary Meeting of ICAC, held at Goiania, Brazil

Dr. Sreenivasan, Director, CIRCOT was deputed from Indian Council of Agricultural Research, New Delhi as a member of the Indian Delegation to take part at the 65th Plenary Meeting of ICAC held at Goiania, Brazil from 11.9.06 to 15.9.06.



Dr. S. Sreenivasan, Dr. R.H. Balasubramanya and Dr. A.J. Shaikh at the 65th Plenary Meeting of ICAC, held at Goiania, Brazil

Dr. R.H. Balasubramanya, Head, CBPD and Principal Investigator, CFC/ICAC/20 alongwith Dr. A.J. Shaikh, Principal Scientist, CBPD also attended the Plenary Session and made presentation on the progress made at CIRCOT on the project on Byproduct Utilisation funded by CFC, Netherlands. They also attended the CFC Stake Holders Meeting held on 10.9.06.

Demonstration Plant for Particle Board Preparation at GTC, Nagpur

A one tonne per day capacity cotton stalk particle board demonstration plant has been set up at GTC Nagpur with the financial assistance from Common Fund for Commodities (CFC), Netherlands. This plant is meant for demonstration of the technology to the prospective entrepreneurs for setting up particle board plants in rural areas. The experience so far gained has indicated that the farmer can get at least Rs. 500/- per tonne for the cotton stalks and by setting up a 20 TPD plant in a cotton growing belt, there could be generation of employment for rural masses. Needless to add that the environmental benefit in terms of saving the forest resource is the highlight of this technology.



Demonstration Plant for Particle Board Preparation

HANDBOOK OF METHODS OF TESTS

The following two volumes are published by CIRCOT covering the whole spectrum of test methods from fibre to fabric.

Handbook of Methods of Tests for cotton Fibres, Yarn and Fabrics

Part I : Ginning Tests, Fibre Tests, Moisture Tests and Structural Tests

Part II: Mechanical Processing, Yarn Tests and Fabric Tests

The cost is Rs. 200/- each + postal charges extra. Please contact the Director, CIRCOT, Mumbai for copies.

ANNUAL COTTON QUALITY UPDATE

CIRCOT has been furnishing authoritative data on the technological properties of Standard and Trade varieties of cotton every year. The globalisation of economy and stringent quality norms required to be met by exporting units have made cotton trade and spinning industry realize the importance of objective testing of raw material. In view of the demand from textile industry and trade CIRCOT publishes the **Annual Cotton Quality Update** every year. This update containing information on essential fibre quality characteristics of varieties under commercial transactions is available well within the cotton season of that year. Apart from the fibre quality parameters, ranges and mean values for each property, frequency distributions for length, length uniformity, fineness and strength are also provided in the update. Highlights of statistical data are also given.

CIRCOT is now making available the fibre quality data through internet starting from the current cotton season 2005-2006. Interested persons can get the information by visiting CIRCOT's web site [_http://circot.res.in](http://circot.res.in)



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