



Cotton is known for its natural textile fibre, nutrient rich oil and feed. World's production and consumption of cotton fibre in 2014-15 was 26.18 and 24.24 Million Tons, respectively (ICAC, 2015). Genetic improvement for higher and superior fibre production and modifying cottonseed for better food and feed will ensure effective utilisation of cotton and it's by products for betterment of mankind. One of the recent milestone in cotton science is decoding of cultivated cotton genomes and their progenitors, which will further helps in identifying contributing genetic factors for the useful economic traits within *Gossypium* genus. The genus *Gossypium* comprises of 46 diploid ( $2n = 2x = 26$ ) and 6 tetraploid ( $2n = 4x = 52$ ) species. Diploid species of *Gossypium* has been categorised in to eight genome groups as A-G and K. Tetraploids cottons (AD genome) have evolved through the process of hybridization followed by polyploidization between cultivated A and D genome diploid species. It is fascinating to note that tetraploid cotton which are known for superior fibre quality and high yield potential have evolved from the inter-specific hybridisation of A genome diploid species (*G. arboreum*) having poor fibre quality traits with D-genome diploid species (*G. raimondii*) that do not even produce spinnable fiber.

It was estimated that genome size of *G. arboreum* (1,746 Mb/1C) is two times bigger that of *G. raimondii* (885 Mb/1C) (Hendrix & Stewart, 2005). With the recent advances in scientific and technological processes, diploid progenitor of American cotton, *G. Raimondii* (D5) genome was successfully sequenced and assembled in 2012 independently by two research groups (Wang et al., 2012 and Paterson et al., 2012). Another putative diploid cultivated donor species, *G. arboreum* (A2) genome was also sequenced and assembled (Li et al., 2014). In this current year, most predominantly cultivated species of cotton, *G. hirsutum* (AD) genome sequence was assembled and published by two research groups (Li et al., 2015 and Zhang et al., 2015). Major highlights of the published genome sequence information are tabulated here.

## Cotton Genome Sequencing: An update

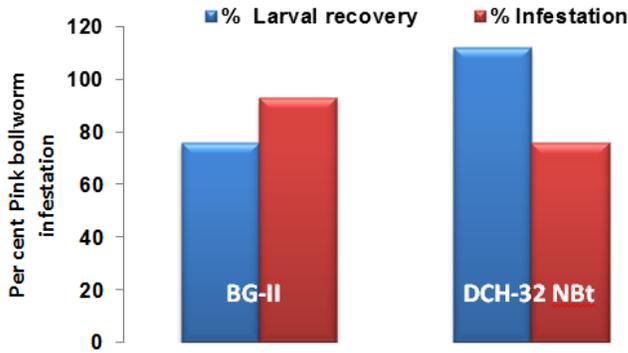
K. P. Raghavendra and H. B. Santosh, Scientists, ICAR – CICR, Nagpur

### Suggested readings:

- Wang, K. et al. 2012. The draft genome of a diploid cotton *Gossypium raimondii*. Nat. Genet. 44, 1098–1103.
- Paterson, A.H. et al. 2012. Repeated polyploidization of *Gossypium* genomes and the evolution of spinnable cotton fibres. Nature 492, 4 23–427.
- Li, F.G. et al. 2015. Genome sequence of the cultivated cotton *Gossypium arboreum*. Nat. Genet. 46, 567–572.
- Li, F.G. et al. 2015. Genome sequence of cultivated Upland cotton (*Gossypium hirsutum* TM-1) provides insights into genome evolution Nat. Biotech. 33, 524–530.
- Zhang, T et al. 2015. Sequencing of allotetraploid cotton (*Gossypium hirsutum* L. acc. TM-1) provides a resource for fiber improvement. Nat. Biotech. 33, 531–537.
- Hendrix, B. & Stewart, J.M. 2005. Estimation of the nuclear DNA content of *Gossypium* species. Ann

Cotton Species	Genome Code	Estimated genome size (Hendrix and Stewart 2005)	Sequenced genome size	Materials used in the study	Sequencing platform	N50* Contig Scaffold (kb)	No. of predicted protein coding genes	No. Predicted MicroRNA	Percent repeat sequences	NCBI Accession Code.	Reference
<i>Gossypium raimondi</i>	D5	880Mb	775.2Mb	D5-3 (CMD10)	Illumina HiSeq 2000	2,284kb	40,976	348	57.0	PRJNA82769	Wang et al., 2012
<i>Gossypium raimondi</i>	D5	880Mb	737.8 Mb	<i>G. raimondii</i>	Applied Biosystems 3730xl, Roche 454XLR & Illumina GAllx	18.8Mb	37,505	364	61.0	PRJNA171262	Paterson et al., 2012
<i>Gossypium arboreum</i>	A2	1677–1746Mb	1694 Mb	Cv. Shixiya1 (SXY1)	Illumina HiSeq 2000	665.8kb	41,330	431	68.5	SRA150181	Li et al., 2014
<i>Gossypium hirsutum</i>	AD	2347 – 2489Mb	2,173 Mb	TM-1	Illumina HiSeq 2000	764kb	76,913	301	67.2	PRJNA259930	Li et al., 2015
<i>Gossypium hirsutum</i>	AD	2347 – 2489Mb	2400Mb	TM-1	Illumina HiSeq 2000 Sanger sequencing	1600kb	70,478	602	64.8	PRJNA248163	Zhang et al., 2015

\*Quality indicator of a genome assembly



# Pink bollworm incidence noticed in Karnataka

*Dr Shivaleela, Asst Prof Raichur and Dr V. Chinna Babu Naik, Scientist, CICR*

The incidence of pink bollworm on Bt- cotton hybrids (BG-II) was found for the first time at MARS, Raichur, Karnataka at 100 DAS. Larval recovery and per cent infestation in Bt- cotton hybrids (BG-II) 76.00% and 93.00 % respectively. However, larval recovery and per cent infestation in NBt (DCH-32) at 100 DAS was recorded 112.00% larval recovery and 93.00% infestation in NBt (DCH-32) green bolls were recorded. The incidence of pink bollworm was known in Gujarat but recently it expanded in other cotton growing states like Maharashtra, Telangana, Andhra Pradesh and Karnataka on Bt cotton



## ICAR-CICR celebrated 67th Republic Day

The 67th Republic Day was celebrated in ICAR-CICR with bliss and fervor on 26th January 2016. The National flag was hoisted by Dr. K. R. Kranthi, Director, CICR, Nagpur. In his address, he appreciated and encouraged the scientists and other staff who had contributed for the significant achievements of the institute especially for the efforts put in on, e-Kapas- for sending advisories to farmers through voice SMS, classification of whitefly/CLCuD tolerant and susceptible hybrids in North India for the benefit of farmers, identification of early duration cotton variety bursting in about 110 days, experiment on cropping systems, development and testing of stripper type harvester, survey and resistance monitoring of Pink Bollworm. He also congratulated scientists for best oral and poster presentations in national and international conferences and also for best representation of scientific views in international forums. He asked all the scientists and other staff members to work as a team to address the problems/crisis faced by the Indian cotton farmers. Dr. G. Balasubramani, Secretary, Recreation Club, had arranged various games for all the staff members and the winners were distributed Prizes. All the Staff of ICAR-CICR joined the celebrations.



## News Paper Clippings



attack of white fly in Punjab and pink boll worm in Gujarat had brought down the yield. Pink boll worm seems to have developed resistance to boll-guard II in Gujarat. Also, because of virtually no rain in November and December that extend the total output, this year's production has fallen. "The production has fallen in Maharashtra compared to last year due to drought in Marathwada. Still, Maharashtra and Gujarat continue to be highest producers," he said.

As per Cotton Association of India (CAI), this year the projected estimates for Gujarat and Maharashtra are 96.50 lakh bales and 81.75 lakh bales whereas last year they were 108 and 78.5 lakh bales respectively.

Cotton growers who have suffered losses due to drought are crying foul over state government not including cotton in the compensation list of crops.

1/22/2016

केवळ ३ तासांत अडीच एकरांतील कापूस वेचणी शक्य, यंत्राचे यशस्वी प्रात्यक्षिक - Divyamarathi Bhaskar

divyamarathi.com

दिवा मराठी 22.1.2016

अजुन वेळकर | Jan 22, 2016, 08:35AM IST



एकरांतील कापूस वेचणी सहज करता येते.

### केवळ ३ तासांत अडीच एकरांतील कापूस वेचणी शक्य, यंत्राचे यशस्वी प्रात्यक्षिक

नागपूर - नागपुरातील केंद्रीय कापूस संशोधन संस्थेने (सीआयसीआर) लुधियाना येथील सेंटर ऑफ पक्सलन्स इनफार्म मशिनरीच्या सहकार्याने (सीओईएफएम) सिंगलटाइप कापूस वेचणी यंत्र विकसित केले असून त्याची यशस्वी प्रात्यक्षिकेही घेण्यात आली आहेत. संस्थेचे वरिष्ठ शास्त्रज्ञ गौतम मजुमदार यांनी 'दिवा मराठी'ला ही माहिती दिली.

हे नवे यंत्र ट्रॅक्टर माउंटेड करण्यात आल्यामुळे ट्रॅक्टरसोबत सहज जोडता येते. सध्या प्रात्यक्षिक घेण्यात येत आहे. त्यातून आलेले निष्कर्ष आणि लक्षात आलेले दोष दूर करून यश्रभारत महिंद्रासोबत करार करून व्यावसायिक उत्पादन करण्याचा प्रयत्न आहे. हे कापूस वेचणी यंत्र तीन तासांत एक हेक्टर म्हणजे अडीच एकरांतील कापूस वेचणी करीत असून त्यात काडीकचऱ्याचे प्रमाणही नगण्य राहते, असा दावा मजुमदार यांनी केला. विदर्भमराठ सह्या ते सात

सिंगलटाइप कापूस वेचणी यंत्रामुळे विदर्भातून केव्हाही वेचणी करता येते. साधारणतः सिंगलटाइप यंत्रामध्ये पूर्ण फुटलेल्या कापूस बोंडांची वेचणी होते. न फुटलेल्या या अर्धे फुटलेल्या बोंडांची वेचणी होत नाही. या यंत्रात हे दोष दूर करण्यात आले आहेत. पंजाबमधील सधन शेतकऱ्यांकडे सध्या ३० ते ४० लाखांत येणारी आणि तीन तासांत एक हेक्टरमधील कापूस वेचणी करणारी यंत्रे आहेत. चार-पाच शेतकरी मिळून एक मशीन विकत घेतात. पंजाब, मध्य प्रदेश व महाराष्ट्रात येऊन कापूस वेचणीची कामे करतात. येवून मोठी कमाई करून परत जातात. मात्र त्यापेक्षा स्वस्त असलेले हे स्वदेशी कापूस वेचणी यंत्र बाजारात आल्यावर आपल्याकडेही सधन शेतकरी या शेतकऱ्यांचे गट हे यंत्र विकत घेऊन व्यवसाय करू शकतात. भविष्यात शेतीकामाला होणारी मजुरांची कमतरता लक्षात घेता हा चांगला पर्याय ठरू शकतो, असे सीआयसीआरचे संचालक डॉ. केशव फ्रांसी यांनी या वेळी बोलताना सांगितले.

#### यंत्राची वैशिष्ट्ये

स्वदेशी निर्मितीचे हे कापूस वेचणी यंत्र हाताळण्यास सोपे असून ते चालवायला कोणत्याही तांत्रिक कौशल्याची गरज नाही.

#### किंमत १५ ते २० लाख

यातून एक मीटर उंचीच्या कापसाच्या झाडाची बोंडे सहज काढता येतात. या यंत्राचे वजन १५०० किलोग्रॅम असून यासाठी ६० अक्षताची ट्रॅक्टर लागते. हे वेचणी यंत्र एका वेळी एका रंगेतील कापूस वेचणी करते.



Produced and Published by:

Chief Editor :

Editors :

Digital Editor, design & Media Support :

Citation : Cotton Innovate, Issue-4, Volume-01, January 2016,  
ICAR-Central Institute for Cotton Research, Nagpur.

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Publication Note: This Newsletter presented online at  
[http://www.cicr.org.in/cotton\\_innovate.html](http://www.cicr.org.in/cotton_innovate.html)

Cotton Innovate is the Open Access CICR Newsletter

The Cotton Innovate – is published weekly by

ICAR-Central Institute for Cotton Research

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