Weekly Publication of

Cotton Association of India

COTTON STATISTICS & NEWS

Edited & Published by Amar Singh

2019-20 • No. 15 • 9th July, 2019 Published every Tuesday

Cotton Exchange Building, 2nd Floor, Cotton Green, Mumbai - 400 033
Phone: 3006 3400 Fax: 2370 0337 Email: cai@caionline.in
www.caionline.in

Drone-Aided Cotton Farming

GUEST COLUMN

Shri. Gautam Majumdar
Scientist (Farm Machinery & Power), Crop Production Division
ICAR-Central Institute for Cotton Research, Nagpur

Shri. Majumdar did his B.E. (Agricultural Engineering) from College of Technology and Agricultural Engineering, Udaipur, in 1985 and went on to do his M.Tech (Industrial Engineering from Ramdeo Baba College of Engineering and Management, RTMNU, Nagpur in 2007. He has been working as Scientist at ICAR-Central Institute for Cotton Research, Nagpur since 1994. He has been working on cotton spraying, planting machines and is currently working on mechanical harvesting of cotton.

Suddenly, drones or UAVs (unmanned aerial vehicles), are in the news everywhere. They are being used or have the potential to be used in as diverse fields as remote sensing, commercial aerial surveillance, oil, gas and mineral exploration, disaster relief, real estate and construction, to film making and pizza delivery. Should cotton cultivation be left out?

Limited trials were conducted by Agriculture Insurance Company (AIC) of India and Skymet, Weather Forecasting Company, in parts of Gujarat to see how drones can assist the Indian agriculture sector. It was concluded that drones can observe agronomic indicators in every square meter of a field which is not possible with satellites. The small, affordable and compact drones provide continuous data and when collected data is processed using thematic mapping system (GIS) at farm scale, produce maps based on themes such as soils or hydrology. Multiple layers of maps can be quickly displayed in a variety of overlap, scales, and combinations to fit the needs of the farmers. Armed with sensors and multi spectral imaging cameras, drones can support Indian cotton farmers in ways unthinkable till now.

Crop Spraying

Cotton crop suffers from the attack of various sucking pests (aphids, thrips, jassids, whiteflies, mirid bugs, etc) and bollworms (American bollworm, spotted bollworm and pink bollworm) right from sowing till harvesting and cause huge economic losses. Therefore, cotton growers resort to spraying chemical pesticides using manual or tractor drawn sprayers. It is a labour intensive operation and poses serious health hazards to operators. Similarly, cotton crop is overwhelmed by weeds during the early stages of cotton growth, when the crop canopy is still not fully developed to overshadow weeds. This is also the time when

it is mostly raining and making it difficult to enter a cotton field to manage weeds manually, by bullock or tractor drawn hoes or by spraying. Application of drones for spraying operations involves less manpower, covers large area in less time, minimises exposure of spray operator to hazardous chemical pesticides and requires reduced quantity of spray fluid. Spraying with drone technology is likely to improve the pest control efficiency by increased canopy coverage of the sprayed chemical thus requiring less frequent applications and reduced drift hazards and contamination of soil and water bodies.

Drone technology will be a boon for dryland cotton farming where water is the major limiting factor. Pre-sowing/ pre-emergence or post-emergence application of herbicides by drone will be a promising approach for effective weed management during initial crop growth stage. Distance-measuring equipment—ultrasonic echoing and lasers enables a drone to adjust height with varying topography and thus drones can scan the ground and spray the correct amount of liquid, modulating distance from the ground or crop canopy and spray in real time for even coverage. This results in efficient operation with saving in chemicals and lesser ground water contamination. Drone spraying is many times faster than manual or tractor spraying. Several Indian companies are now manufacturing such drones to facilitate growers to apply nutrients, pesticides and growth regulators to enhance agricultural productivity.

The benefits of spraying with drones are many:-

1) Zero ground compaction because spraying is done from above without the need for heavy ground vehicles.

2) Access to difficult terrain.

3) Location specific precision applications. Spot spraying of small diseased areas or pest populations.

4) Saving in time, chemicals and fuel.

5) Reduced environmental contamination as treatment area is less.

There still exists a ban on aerial spraying in many countries due to environmental concerns and counter terrorism laws that broadly prevent drones from carrying payloads. Several countries are in the process to amend laws to allow spraying by drones because of the potential benefits and rapid improvements in drone control and safety.

Precision fertilizer application

Nitrogen deficient areas in a crop can be clearly identified from above, using drones fitted with cameras having enhanced sensors. The sensors are calibrated to limit the effect of changing sunlight levels and allow a more accurate calculation of the green area. Drones can

Table 1: Some success stories of drone application in agriculture

S.No.	Nature of application	Countries/region of application
1	Imagery in detecting vine plant health before and after the application of organic nutrition	Republic of South Africa
2	Survey of land use in coffee plantations	India
3	IoT and drones solutions to cattle farming	USA, China, Brazil, Argentina, Russia, India
4	Crop insurance	India

take hundreds of images as opposed to satellites which take images once a day, and at a much lesser cost. The images can be stitched together to form a map and softwares can identify early growth patterns. From this a precise fertilizer application programme can be tailor made for the crop's varying nutrient requirements in different areas of the field resulting in saving of nutrients and higher yields.

Water Management

Hyperspectral, multispectral, or thermal sensors fitted drones can identify which parts of a field are in need of irrigation. During crop growth, drones aid in calculation of the vegetation index, which describes the relative density and health of the crop, and show the heat signature, the amount of energy or heat emitted by crops.

Constraints and the Way Forward

Biggest criticism of drone use in agriculture is its low flight time, needing frequent recharge and limited payload capacity. Wide research gaps exist on the possible use of drones in agriculture, especially crops like cotton with respect to standardisation of height and speed of the drone above crop canopy, doses of spraying chemical, data on aspects as uniformity in spraying, canopy coverage and deposit, drift losses and bio-efficacy on the control of weeds, pests and diseases.

With the current research going on, it will be possible for flight times in excess of 4 hours before recharging. China leads in the use of drones for spraying agricultural crops. It uses drones that are meter in diameter, weigh about 20 kg and carry a payload of 10 litre. They can treat 1 ha/hr. Radar systems and real time knowledge (RTK) GPS are integrated into the drone which flies a pre-set route at location accuracies up to 1cm. The forward and downward looking radar systems allow the drone to keep a consistently low height above the crop, minimising the chance of spray drift. Sophisticated object avoidance software also means the drone can navigate around obstructions.

Regulatory Policies

India has a drone policy called 'Drone Regulations 1.0' that classifies a remotely piloted aircraft and delineates how they can be flown and sets the restrictions under which they will operate. Although it is legal to fly drones in India after Dec 1, 2018, severe restrictions have been imposed so that it becomes cumbersome to operate as and when required, which is its biggest benefit in agriculture. Except Nano drones which weigh less than 250 gm, the rest would have to be registered and issued an unique identification number (UIN). Also Unmanned Aircraft Operator Permit (UAOP) is required by the owners of the drones to fly them. It can be obtained from the Director General of Civil Aviation. However, in the following cases this permit isn't required.

- Nano drones operating below 50 feet in uncontrolled airspace.
- Micro drones (250 gm to 2 kg) operating below 200 feet in uncontrolled airspace - but will need to inform local police 24 hours prior.
- Drones owned and operated by National Technical Research Organisation (NTRO), Aviation Research Centre and Central Intelligence Agencies but only after intimating local police.
- The UAOP will have to be issued by DGCA within seven working days of submission of the necessary documents. These UAOPs are not transferrable and shall be applicable for not more than five years.

All drone operations will have to be approved by Digital Sky Platform. The Digital Sky Platform is a unique unmanned traffic management (UTM) system which is expected to facilitate registration and licensing of drones and operators in addition to giving instant (online) clearances to operators for every flight.

Research in the development of drones and their applications in agriculture in India is still at a very nascent stage. Since the benefits are known from work carried out throughout the world, it is high time researchers in India geared up to translate the benefits to Indian cotton farms. There is also a need to ease regulations a bit so as this technology becomes widely accepted for all farmers to reap the benefits.

(The views expressed in this column are of the author and not that of Cotton Association of India)

Uzbekistan Deleagtion visits CAI

A five member delegation of Uzbekistan consisting of Mr. Vijay Kalantri, Honorary Consul of the Republic of Uzbekistan, Mr. Sherov Abdurakhmon Sattorovich, First Deputy Chairman of the board of JSCB Agrobank, Mr. Namozov Uchkun, Director of Project Finance department of JSCB Agrobank, Mr. Botirov Salokhiddin, Deputy Head of Financing Agriculture Enterprise department of JSCB Agrobank, andMr. Kakhramon Muminov, Head of Correspondent relations and documentary operations of JSCB Agrobank visited Cotton Association of India on Wednesday, 3rd July 2019, and discussed various means of improving bilateral relations between Uzbekistan and India.

Update on Cotton Acreage (As on 04.07.2019)

(Area in Lakh Ha)

Sr. No.	State	Normal Area (DES)*	Normal Area as on Date (2014-2018)	Area Covered (SDA)					
				2019-20	2018-19	2017-18	2016-17	2015-16	2014-15
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	Andhra Pradesh	6.56	1.034	0.430	0.790	2.440	1.600	1.060	0.690
2	Telangana	17.00	7.386	7.895	8.018	12.780	8.330	12.830	4.980
3	Gujarat	26.04	6.868	14.352	4.929	12.680	20.913	20.900	9.660
4	Haryana	6.06	5.666	6.760	6.650	6.300	4.980	5.810	6.380
5	Karnataka	6.47	2.120	0.660	2.220	1.990	1.710	2.880	3.020
6	Madhya Pradesh	5.65	3.393	3.010	4.870	4.560	4.940	5.310	2.300
7	Maharashtra	41.48	11.537	4.565	19.571	21.810	18.972	29.980	8.350
8	Odisha	1.31	0.247	0.406	0.076	0.490	0.170	0.830	0.460
9	Punjab	3.56	4.182	4.020	2.840	3.820	2.560	4.500	5.000
10	Rajasthan	4.76	2.840	3.450	4.430	4.610	3.513	3.490	3.700
11	Tamil Nadu	1.61	0.102	0.031	0.032	0.050	0.031	0.030	0.300
12	Others	0.43	0.231	0.271	0.172	0.286	0.170	0.210	0.260
All India		**120.930**	**45.606**	**45.850**	**54.599**	**71.816**	**67.889**	**87.830**	**45.100**

** Directorate of Economics & Statistics, Ministry of Agriculture and Farmers Welfare, Krishi Bhavan, New Delhi*
Source : Directorate of Cotton Development, Nagpur

Excerpts from India Meteorological Department's Weather Report of 4th July 2019

Forecast for next two weeks

Weather systems & associated Precipitation during Week 1 (04 to 10 July, 2019) and Week 2 (11 to 17 July, 2019)

Rainfall for week 1: (04 to 10 July, 2019)

- In association with Well Marked Low Pressure Area lies over northern parts of central Madhya Pradesh & adjoining south Uttar Pradesh & due to its remnant and due to trough at lower levels over northern parts of the country, widespread rainfall with heavy to very heavy falls at isolated places very likely over West Madhya Pradesh, and East Rajasthan during next 2 days, over northeast Madhya Pradesh, East Uttar Pradesh, Uttarakhand & Himachal Pradesh during most days of the week.

- Intensity of rainfall is very likely to increase over Punjab, Haryana, Chandigarh & Delhi and West Uttar Pradesh with fairly widespread to widespread rainfall with heavy/very heavy falls at isolated places during 2nd half of the week 1.

- Fairly widespread to widespread rainfall with heavy/very heavy falls at isolated places are also likely over Arunachal Pradesh, Assam & Meghalaya and Nagaland, Manipur, Mizoram & Tripura, Bihar, Jharkhand, Odisha and West Bengal & Sikkim during most days of the week.

Annexure IV

METEOROLOGICAL SUB-DIVISIONWISE WEEKLY RAINFALL FORECAST & Wx. WARNINGS-2019

Sr. No	MET.SUB-DIVISIONS	04 JUL	05 JUL	06 JUL	07 JUL	08 JUL	09 JUL	10 JUL
1	ANDAMAN & NICO.ISLANDS	WS*	FWS	FWS	FWS	FWS	FWS*	SCT
2	ARUNACHAL PRADESH	FWS	FWS*	WS**	WS**	FWS	FWS	FWS
3	ASSAM & MEGHALAYA	FWS	FWS*	WS**	WS**	WS**	WS**	WS*
4	NAGA.MANI.MIZO.& TRIPURA	FWS*	WS*	WS**	WS**	WS**	WS**	WS*
5	SUB-HIM.W. BENG. & SIKKIM	SCT	FWS*	WS*	WS*	WS**	WS*	WS
6	GANGETIC WEST BENGAL	FWS	FWS	FWS	WS*	WS*	FWS	FWS
7	ODISHA	FWS	FWS	FWS*	FWS*	FWS	WS	WS
8	JHARKHAND	SCT	FWS	WS*TS	WS*TS	WS*	WS	FWS
9	BIHAR	SCT	FWS TS	WS TS	WS**TS	WS**	WS	FWS
10	EAST UTTAR PRADESH	ISOL TS	WS**	WS**	WS**	WS**	WS*	WS*
11	WEST UTTAR PRADESH	SCT*TS	FWS*	FWS*	FWS*	WS**	FWS	FWS
12	UTTARAKHAND	WS**	WS**	WS**	WS**	WS	WS*	WS
13	HARYANA CHD. & DELHI	SCT TS	SCT	FWS*	FWS*	FWS*	WS*	FWS
14	PUNJAB	ISOL	SCT	SCT*	FWS*	WS*	WS	WS*
15	HIMACHAL PRADESH	FWS*TS	FWS*TS	FWS*	WS**	WS**	WS	FWS
16	JAMMU & KASHMIR	SCT TS	FWS	SCT	SCT	FWS**	FWS	FWS
17	WEST RAJASTHAN	SCT	ISOL	ISOL	ISOL	ISOL	ISOL	ISOL
18	EAST RAJASTHAN	WS**	FWS*	SCT	ISOL	ISOL	SCT	SCT
19	WEST MADHYA PRADESH	WS**	WS**	FWS	SCT	SCT	FWS*	FWS
20	EAST MADHYA PRADESH	WS*	WS**	WS**	WS**	WS**	WS**	WS*
21	GUJARAT REGION D.D. & N.H.	FWS*	FWS	SCT	SCT	SCT	SCT	SCT
22	SAURASTRA KUTCH & DIU	SCT	SCT	ISOL	ISOL	ISOL	SCT	SCT
23	KONKAN & GOA	WS*	WS*	WS*	WS**	WS**	WS**	WS**
24	MADHYA MAHARASHTRA	FWS*	SCT	SCT	SCT	SCT	FWS	FWS
25	MARATHAWADA	SCT	ISOL	ISOL	ISOL	SCT	SCT	FWS
26	VIDARBHA	FWS	FWS	SCT	SCT	SCT	FWS	FWS
27	CHHATTISGARH	FWS*	FWS	WS*	WS*	WS*	FWS	FWS
28	COASTAL A. PR. & YANAM	SCT	SCT*	SCT	SCT	SCT	SCT	FWS
29	TELANGANA	SCT	SCT	SCT	SCT	SCT	SCT	FWS
30	RAYALASEEMA	ISOL	ISOL	ISOL	ISOL	ISOL	ISOL	SCT
31	TAMIL. PUDU. & KARAIKAL	ISOL	ISOL	ISOL	ISOL	ISOL	ISOL	ISOL
32	COASTAL KARNATAKA	WS*	WS	WS*	WS*	WS*	WS*	WS
33	NORTH INT.KARNATAKA	FWS	SCT	SCT	FWS	FWS	FWS	FWS
34	SOUTH INT.KARNATAKA	SCT*	SCT	SCT	FWS	FWS	FWS	FWS
35	KERALA & MAHE	WS*	WS*	WS	FWS	SCT	SCT	FWS*
36	LAKSHADWEEP	FWS	FWS	SCT	SCT	SCT	FWS	FWS

LEGENDS:

WS	WIDE SPREAD / MOST PLACES (76-100%)	FWS	FAIRLY WIDE SPREAD / MANY PLACES (51% to 75%)		
SCT	SCATTERED / FEW PLACES (26% to 50%)	ISOL	ISOLATED (up to 25%)	D/DRY	NIL RAINFALL

*Heavy Rainfall (64.5-115.5 mm)	**Heavy to Very Heavy Rainfall (115.6-204.4 mm)	***Extremely Heavy Rainfall (204.5 mm or more)		
FOG	*SNOWFALL	#HAILSTORM	HEAT WAVE (+4.5 °C to +6.4 °C)	#SEVERE HEAT WAVE (> +6.4)
$THUNDERSTORM WITH SQUALL/GUSTY WIND	DS/TS DUST/THUNDERSTORM	COLD WAVE (-4.5 °C to -6.4 °C)	#SEVERE COLD WAVE (< -6.4)	

- Widespread rainfall with heavy/very heavy falls at isolated places is also likely along west coast during the week.

- Fairly widespread to widespread rainfall is very likely to occur over Arunachal Pradesh, Assam, Meghalaya, Nagaland, Manipur, Mizoram & Tripura, West Bengal & Sikkim, Jharkhand, Madhya Maharashtra, Coastal Andhra Pradesh, Telengana, Kerala and Andaman & Nicobar Islands during the week 1. Isolated heavy rainfall is also likely over these areas during some days of the week 1.

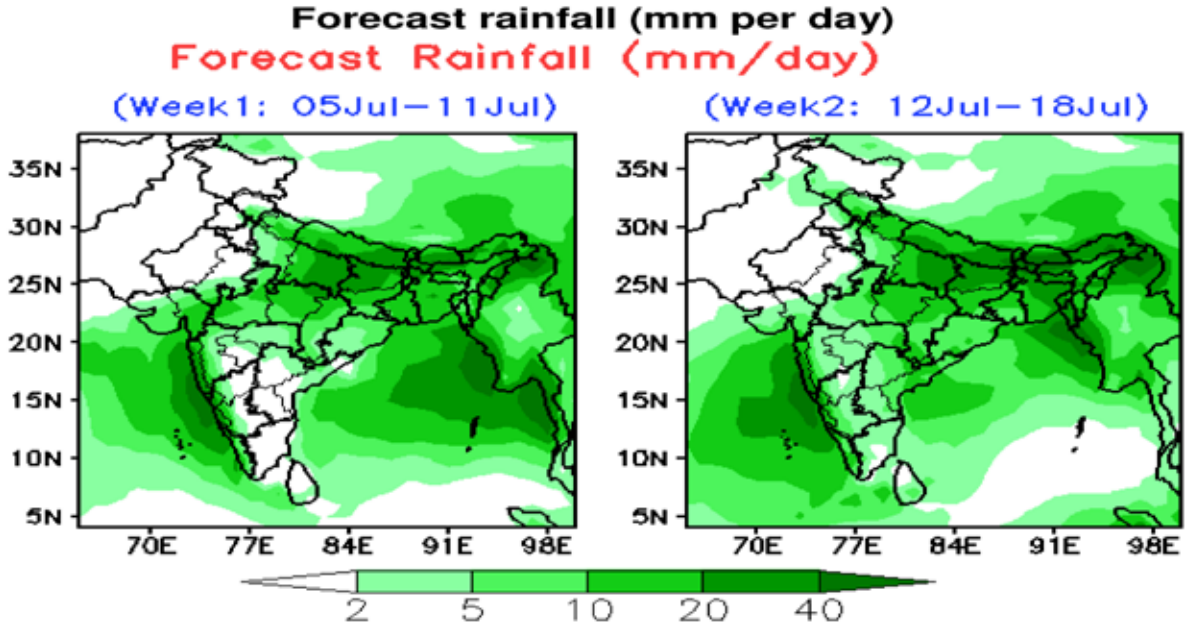
- Isolated to scattered rainfall activity likely to occur over rest parts of the country (Annexure IV).

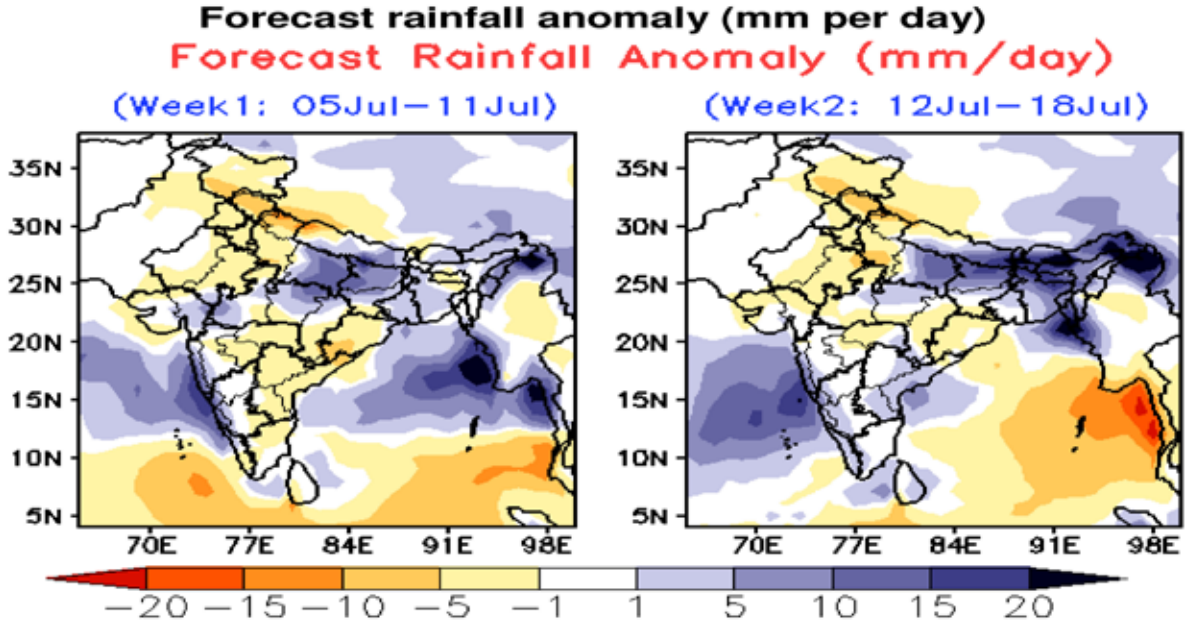
- Cumulatively, above normal rainfall likely over some parts of Madhya Pradesh & Jharkhand, most parts of East Uttar Pradesh, Bihar & along the west coast and many parts of northeastern states. It is very likely to be normal to below normal over remaining parts of the country during week 1 (Annexure V).

Rainfall for week 2: (11 to 17 July, 2019)

- During week 2, cumulatively, above normal rainfall likely over most parts of East Uttar Pradesh, Bihar, northeast Madhya Pradesh, Jharkhand, West Bengal & Sikkim and northeastern states; and normal to above normal over south Peninsular India. It is very likely to be normal to below normal over remaining parts of the country during week (Annexure V).

Annexure V





Since 1921,
we are dedicated to the cause of Indian cotton.

Just one of the reasons, you should use our Laboratory Testing Services.

The Cotton Association of India (CAI) is respected as the chief trade body in the hierarchy of the Indian cotton economy. Since its origin in 1921, CAI's contribution has been unparalleled in the development of cotton across India.

The CAI is setting benchmarks across a wide spectrum of services targeting the entire cotton value chain. These range from research and development at the grass root level to education, providing an arbitration mechanism, maintaining Indian cotton grade standards, issuing Certificates of Origin to collecting and disseminating statistics and information. Moreover, CAI is an autonomous organization portraying professionalism and reliability in cotton testing.

The CAI's network of independent cotton testing & research laboratories are strategically spread across major cotton centres in India and are equipped with:

- State-of-the-art technology & world-class Premier and MAG cotton testing machines
- HVI test mode with trash% tested gravimetrically

LABORATORY LOCATIONS

Current locations : • **Maharashtra :** Mumbai; Yavatmal; Aurangabad • **Gujarat :** Rajkot; Kadi; Ahmedabad • **Andhra Pradesh :** Adoni • **Madhya Pradesh :** Khargone • **Karnataka :** Hubli • **Punjab :** Bathinda • **Telangana:** Warangal, Adilabad

UPCOMING LOCATIONS

• **Telangana:** Mahbubnagar

COTTON ASSOCIATION OF INDIA
Established 1921

COTTON ASSOCIATION OF INDIA
Cotton Exchange Building, 2nd Floor, Opposite Cotton Green Station, Cotton Green (East), Mumbai 400 033, Maharashtra, INDIA.
Tel.: +91 22-3006 3400 • Fax: +91 22-2370 0337 • E-mail: cai@caionline.in • www.caionline.in

UPCOUNTRY SPOT RATES

(Rs./Qtl)

Standard Descriptions with Basic Grade & Staple in Millimetres based on Upper Half Mean Length [By law 66 (A) (a) (4)]							Spot Rate (Upcountry) 2018-19 Crop July 2019					
Sr. No.	Growth	Grade Standard	Grade	Staple	Micronaire	Strength /GPT	1st	2nd	3rd	4th	5th	6th
1	P/H/R	ICS-101	Fine	Below 22mm	5.0-7.0	15	11585 (41200)	H	11585 (41200)	11585 (41200)	11585 (41200)	11585 (41200)
2	P/H/R	ICS-201	Fine	Below 22mm	5.0-7.0	15	11726 (41700)		11726 (41700)	11726 (41700)	11726 (41700)	11726 (41700)
3	GUJ	ICS-102	Fine	22mm	4.0-6.0	20	9758 (34700)		9758 (34700)	9645 (34300)	9645 (34300)	9589 (34100)
4	KAR	ICS-103	Fine	23mm	4.0-5.5	21	10911 (38800)	O	10911 (38800)	10911 (38800)	10911 (38800)	10911 (38800)
5	M/M	ICS-104	Fine	24mm	4.0-5.0	23	11192 (39800)		11332 (40300)	11473 (40800)	11473 (40800)	11473 (40800)
6	P/H/R	ICS-202	Fine	26mm	3.5-4.9	26	12879 (45800)	L	12795 (45500)	12795 (45500)	12766 (45400)	12738 (45300)
7	M/M/A	ICS-105	Fine	26mm	3.0-3.4	25	11585 (41200)		11529 (41000)	11529 (41000)	11473 (40800)	11417 (40600)
8	M/M/A	ICS-105	Fine	26mm	3.5-4.9	25	11867 (42200)		11810 (42000)	11810 (42000)	11754 (41800)	11698 (41600)
9	P/H/R	ICS-105	Fine	27mm	3.5.4.9	26	13020 (46300)	I	12935 (46000)	12935 (46000)	12907 (45900)	12879 (45800)
10	M/M/A	ICS-105	Fine	27mm	3.0-3.4	26	11810 (42000)		11754 (41800)	11754 (41800)	11698 (41600)	11642 (41400)
11	M/M/A	ICS-105	Fine	27mm	3.5-4.9	26	11979 (42600)	D	11923 (42400)	11923 (42400)	11867 (42200)	11810 (42000)
12	P/H/R	ICS-105	Fine	28mm	3.5-4.9	27	13076 (46500)		12991 (46200)	12991 (46200)	12963 (46100)	12935 (46000)
13	M/M/A	ICS-105	Fine	28mm	3.5-4.9	27	12457 (44300)		12401 (44100)	12401 (44100)	12345 (43900)	12288 (43700)
14	GUJ	ICS-105	Fine	28mm	3.5-4.9	27	12485 (44400)	A	12429 (44200)	12429 (44200)	12373 (44000)	12317 (43800)
15	M/M/A/K	ICS-105	Fine	29mm	3.5-4.9	28	12710 (45200)		12654 (45000)	12654 (45000)	12598 (44800)	12542 (44600)
16	GUJ	ICS-105	Fine	29mm	3.5-4.9	28	12682 (45100)	Y	12626 (44900)	12626 (44900)	12570 (44700)	12513 (44500)
17	M/M/A/K	ICS-105	Fine	30mm	3.5-4.9	29	12991 (46200)		12935 (46000)	12935 (46000)	12935 (46000)	12935 (46000)
18	M/M/A/K/T/O	ICS-105	Fine	31mm	3.5-4.9	30	13244 (47100)		13188 (46900)	13188 (46900)	13188 (46900)	13188 (46900)
19	A/K/T/O	ICS-106	Fine	32mm	3.5-4.9	31	13554 (48200)		13498 (48000)	13498 (48000)	13498 (48000)	13498 (48000)
20	M(P)/K/T	ICS-107	Fine	34mm	3.0-3.8	33	15550 (55300)		15550 (55300)	15550 (55300)	15550 (55300)	15550 (55300)

(Note: Figures in bracket indicate prices in Rs./Candy)