Problems and Prospects of Cotton Cultivation in Gujarat

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Cotton in India

- In pre-independent era dominance of desi cotton was in India & people used to wear “Khadi”.
- Due to cotton research, desi cotton area was reduced & was replace by American Cotton.
- During British rule, different American cotton varieties were introduce & same where popularized.
- Even though, for cloth making India has to import long staple cotton and had to spent foreign exchange.
- In 1921 Indian Central Committee was established which accelerated the cotton research work.
- At many places in India, cotton research were started & as a result American cotton varieties dominated.

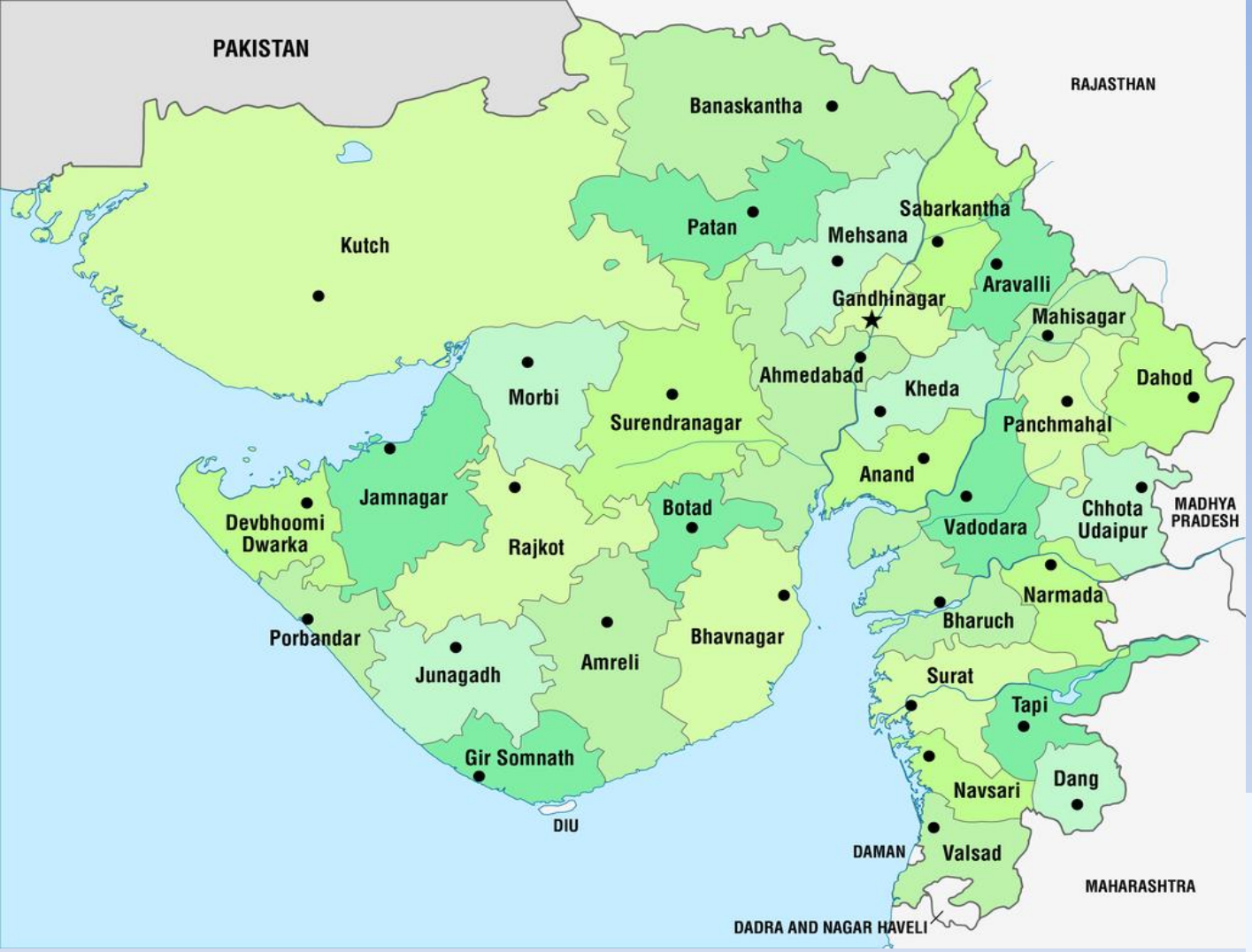
Cotton in Gujarat

- Evidence of cotton cultivation in 16th century in the area of Surat, Kanam & Vagad was found.
- At that time Surti-1, Bharuchi-1 & Goghari were the popular varieties.
- In 1843 at Bharuch 1st cotton mill was established which promoted cotton cultivation.
- In 1896 Britisher started cotton research scheme at Surat.
- In 1951 the 1st American cotton variety Deviraj was released for farmers. There after Devitej, Gujarat-67, Guj.Cotton-100, Guj. Cotton-10 etc. were released.

- In 1971, Dr.C.T.Patel had released the 1st commercial cotton hybrid of world i.e. Hybrid-4 from Surat .
- This bring white revolution in cotton cultivation.
- India was able to export the cotton.
- There after G.cot. Hybrid-6, G.cot. Hybrid-8, G.cot. Hybrid-10, G.cot. Hybrid-12 & G.cot. Hybrid-14 were released from Surat centre.
- For tribal also in 1977 budded cotton G.cot. 101 was released, which was 1st of its types.
- In 80's & 90's due to heavy infestation of pest in hybrid cotton, cotton growers were in difficulties.

- The 1st desi hybrid was also released from Surat i.e. G.Cot.Desi Hybrid-7 & was followed by G.Cot.Desi Hybrid-9.
- In 2002, Indian Government approved Bt. Cotton cultivation & golden era was started.
- In 2012, the 1st public sector Bt. of world i.e. G.Cot.Hybrid-6 (BG-II) and G.Cot.Hybrid-8 (BG-II) were approved.
- Large collection of germplasm 3632 & 15 wild species are also credited to Surat.
- Up to date 50 varieties/ hybrids, 62 crop production techniques, 33 crop protection techniques & 11 other techniques were recognized for farmers.

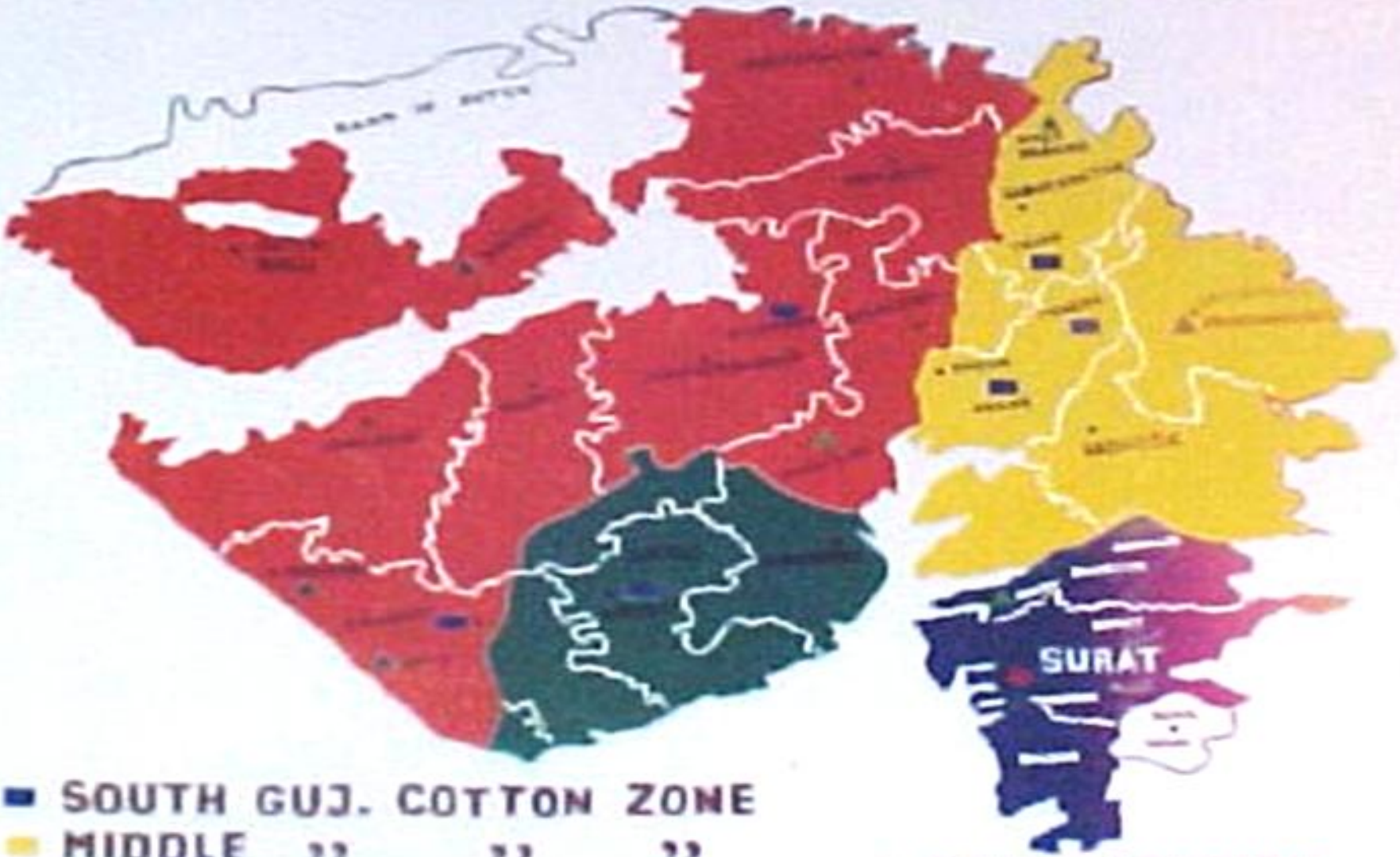
Districts of Gujarat



Gujarat is situated in west India. Gujarat has God gift of 1600 K.M. long sea shore. Cotton is grown in most of districts of Gujarat except Navsari, Valsad & Dang.

COTTON IN GUJARAT

ZONES AND RESEARCH STATIONS



Historical Building of Cotton Research in Gujarat Estd.: 1896

Main Cotton Research Station 2017

Productivity of Cotton in last five decades

		Gujarat			India		
Year		Av. Produ-ctivity (Kg/ha)	Average increase in Yield (Kg/ha /year)	Average growth rate over previous era(%)	Av. Produ-ctivity (Kg/ha)	Average increase in Yield (Kg/ha /year)	Average growth rate over previous era(%)
Pre Hybrid era	1960-61 to 70-71	150			117		
Hybrid era	1971-72 to 01-02	247	3.23	2.16	214	3.24	2.77
Bt era	2002-03 to 16-17	683	29.8	11.77	496	18.81	8.80

Cotton Area, Production and Productivity in Gujarat and India

Year	Gujarat			India		
	Area Lakh ha	Production Lakh Bales	Productivity Lint kg/ha	Area Lakh ha	Production Lakh Bales	Productivity Lint kg/ha
2001-02	16.87	32.50	328	87.30	158	308
2002-03	16.34	30.50	317	76.67	136	302
2003-04	16.47	50.00	516	76.30	179	399
2004-05	19.06	73.00	651	87.86	243	470
2005-06	19.06	89.00	794	86.77	241	472
2006-07	23.90	103.00	733	91.44	280	521
2007-08	24.22	110.00	772	94.14	307	554
2008-09	23.54	90.00	650	94.06	290	524
2009-10	26.54	98.00	635	103.10	305	503
2010-11	26.33	103.00	686	111.42	339	517
2011-12	29.62	118.80	700	121.89	353	493
2012-13	24.97	89.80	633	119.78	365	518
2013-14	25.19	120.80	837	115.53	375	552
2014-15	27.73	108.80	687	128.19	386	511
2015-16	27.19	90.80	588	118.77	338	484

Problems

- Cotton an attractive crop and much more remunerative crop.
- Cotton growing area was increased in Bt Era i.e. after 2002 and reached to 30 Lakh ha.
- Production and productivity were also increased.
- In pre hybrid Era, late maturity, low yield and inferior fibre quality.
- In hybrid Era, infestation of heliothis, spodoptera were the main headache of cotton growers.
- In Bt Era, infestation of sucking pests, mealy bug havoc, pink bollworm damage, leaf reddening, para wilt, illegal Bt and low prices.

Pre Hybrid Era

Continuous cotton research, exchange of germplasm made possible to overcome the problem of late maturity in desi cotton. This factor also helped in improving the fibre quality with higher production.

Hybrid Era

- Increased the production and income
- Mono cropping and lack knowledge of insecticide use Resistance in the insects
- Regular schedule of spraying
- Farmers showed over enthusiasm
- Use higher and higher doses
- Insecticides were less effective
- Cost of cultivation in cotton went high
- Farmers debt went high and committed suicide

Hybrid Era

- For controlling heliothis, numbers of insecticides were recommended
- Cotton area was reduced
- Introduction of Bt cotton

Bt Era

- Bt Era changed the scenario of cotton cultivation and production
- In the beginning heliothis and spodoptera were controlled without any spraying
- The area shoots up to16 to 30 lakh ha in 10 years
- Productivity also reach up to 837 kg/ha
- No. of Bt hybrids captured the market which confused the farmers
- After very short Golden period farmers again faces the new problems

Mealy bug

- In 2006, mealy bug became havoc
- Farmers were not familiar to life cycle and control measures
- Threatened the cotton eco system
- Effective strategies were formulated
- Sanitation of field borders
- Off season management of alternate weed hosts
- Application of neem products
- Interspersing of eco-feast crop
- Application of green insecticides

Cotton mealy bug (*Phenacoccus solenopsis)*

Pink bollworm

- Infestation was noticed for the first time in BG I in 2010 and prolonged upto date
- In general, damage was observed in non Bt late maturing cotton varieties
- Bt cotton hybrids it was reported in the early stage
- Continued till the maturity
- In some cases farmers uprooted the crop
- Complaints of farmers covered electronic and print media
- The Government officials, researchers, private sector bothered for the problems
- Numbers of meetings/ farmers trainings/ seminars were organized
- Final strategies were formulated

Pink bollworm

- Farmers were advocated regarding refuge crop
- Knowledge identification of PBW
- Farmers advised to use approved seeds, pheromone traps
- Regular field scouting for flower, green boll and open boll damage
- Spraying of safer insecticides at ETL
- Timely terminate the crop
- Avoid long term storage

Leaf Reddening

- Many reasons for leaf reddening
- Depletion of nutrients
- Low use of organic matters
- Sucking pest pressure
- Boll ripening at once
- Anaerobic conditions
- Adopt proper crop rotation
- Efficient use of fertilizers/ organic matters, control of sucking pests

Para wilt devastated cotton field

Para wilt

- Parawilt is not introduced in Bt Era
- Problem in light soils
- Noticeable difference in day and night temperature
- Heavy rainfall followed by high temperature
- None use of organic material
- Sow the crop on ridges
- Use of more organic matter
- Increase drainage capacity
- Adopt Interculturing
- Puncture the soil near root zone to improve aeration followed by drenching of 2% urea

Spurious Seed

- Number of private companies with number of hybrids entered in market
- No control on price
- Poor farmers use spurious seeds
- Spurious seeds is not up to mark
- Created problems like susceptible to bollworm
- F_2 seeds available in market
- Strict vigilance by the Government
- Awareness movement for authorized seeds
- Noticeable punishment

Future Strategies

- Modification of plant morphoframe for high yield in different agro-eco-situations, high photosynthetically efficient, low input responsive, efficient plant types, genetic enhancement for yield, quality and resistance to biotic and abiotic stresses.
- Development and exploitation of transgenic cotton with novel genes for resistance to insect pests, drought/salinity and fibre quality.
- Strengthening genetic pool and its utilization and molecular breeding.
- Development of integrated approaches for nutrient (INM), weeds (IWM) and pests (IPM) management for precision farming, climate changes, nano technologies and mechanization.
- Crop management for transgenic, conventional and organic cotton.

About Us

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