TOBACCO PRODUCTION AND PROTECTION TECHNOLOGIES FOR IMPROVING THE PRODUCTIVITY & QUALITY (AGRONOMIC PRACTICES)

Table 1: Crop production practices for FCV tobacco in India

Cultural Practice	Andhra Pradesh			Karnataka
	Black Soils	Northern Light Soils	Southern Light Soils	Karnataka Light Soils
Variety	CTRI Sulakshana, Siri, VT-1158 and Hema	Kanchan, CH-1, LT Kanchan	CTRI Sulakshana, N-98, Siri, Hema, VT-1158 and Kanthi	Kanchan, FCH-222, CH-3 and Thrupthi
Preparatory Cultivation	Deep ploughing in summer, 2-3 ploughings between July and September	Deep ploughing and Disking with tractor with the onset of monsoon	Deep ploughing between July and September	Deep ploughing in March and April
Organic manures (tonnes/ ha)	FYM @7.5	Sunnhemp green manuring @ 20 kg /acre or application of FYM or FPC @10-12 t/ha or sheep or cattle penning	FYM @ 5	FYM @ 8-10
Date of planting	Mid October to mid November	Mid-Sept. to mid-Oct. in upper NLS and mid-Oct. to mid-Nov. in lower NLS	Mid October to Mid. November	1st week of May to middle of June
Spacing	70 x 50 cm	100 x 60 cm	70 x 50 cm	100 x 55 cm
Planting method	Flat planting	Furrow planting followed by ridging on 40 day	Flat planting followed by ridging / earthing up	Flat planting followed by ridging
Method of fertilization	Plant row-plough furrow	Dollop or Drip fertigation	Plant row-plough furrow	Dollop
Fertiliser dose *	45:25:25	115:60:120	60:60:60	60:40:120
(N: P_2O_5: K_2O kg/ha)	60:50:50 (SBS)		60:60:80 (Podili)	
Irrigations	Crop is grown on conserved soil moisture	8-10 irrigations. Or Drip irrigation	One life saving irrigation @ 40-45 days of planting	Grown in S-W monsoon conditions
Intercultural operations	Two at 20 & 40 day after planting	2 or 3 times up to 40 days and ridging on 40 day	2 or 3 times before 40 days	4 or 5 times before 40 days
Level of topping	Judicious topping at first flower opening	Topping at flower bud initiation at 24 leaves	Bud topping	Extended Bud topping
Sucker control	**C-10 fatty alcohol** Decanol or Royalten 4% or Pendimethalin @ 0.5 – 0.6%	**C-10 fatty alcohol** Decanol or Royalten 4% or Pendimethalin @ 0.5 – 0.6% followed by hand desuckering	**C-10 fatty alcohol** Decanol or Royalten 4% or Pendimethalin @ 0.5 – 0.6%	**C-10 fatty alcohol** Decanol or Sucker out or Royalten 4% or Pendimethalin @ 0.5 – 0.6%

Harvesting	Priming mature leaves	Priming mature leaves	Priming mature leaves	Priming mature leaves
Curing method	Flue-curing	Flue-curing	Flue-curing	Flue-curing
Grading	Farm grading	Plant position grading	Farm grading	Plant position grading

Note : Pendimethalin should not be used as weedicide but can be used as Suckericide in tobacco

*Fertiliser schedule for different zones are given in separate page.

Northern Light Soils (NLS)

Option 1

	Name of the Fertiliser	Dose (kg/ha)	N - P_2O_5 - K_2O - Ca (kg/ha)
I Split/ha	Di-Ammonium Phosphate	100 kg	18 - 46 – 0 - 0
	Sulphate of Potash	100 kg	0 – 0 – 50 - 0
II Split/ha	Urea	50 kg	23 – 0 – 0 - 0
	Calcium nitrate	200 kg	31 – 0 - 0 - 38
	Sulphate of Potash	100 kg	0 – 0 – 50 - 0
III Split/ha	Urea	100 kg	46–0 - 0 - 0
	Sulphate of Potash	100 kg	0 – 0 - 50 -0
Total			118 – 46 – 150 – 38

Note * The recommended dose of potassium sulphate is 120 kg/ha. However in light soils, addition of 30 kg/ha can be given

Experiments conducted at CTRI RS, Jeelugumilli showed a saving of 20% of the fertilizers through fertigation and accordingly a fertilizer doses were reduced by 20%. The recommendation of the fertilizers for fertigation is as follows:

Fertilizers recommended for Fertigation in NLS

	Name of the Fertiliser	Dose (kg/ha)	N - P_2O_5 - K_2O - Ca (kg/ha)
Basal /ha	Di-Ammonium Phosphate	75 kg	13.5 – 34.5 – 0
	Sulphate of Potash (soil)	100 kg	0 – 0 – 50
Top dressing /ha	Urea	80 kg	36.8 – 0 - 0
	Ammonium sulphate	50 kg	10.5 – 0 – 0
	Calcium nitrate	50 kg	7.75 – 0 – 0 - 14.25
	Potassium Nitrate	160 kg	20.8 – 0 – 72
Total			90 – 35 – 120 – 14

It is also informed that any other equally effective option that meets the nutrition requirement of the tobacco in terms of N,P, K and also calcium, economically viable without chlorides as approved by the Fertiliser Control Order can also be considered.

Southern Light Soils (SLS): Fertiliser schedule recommended for SLS is 60-60-60. For Podili area, where the soils are light textured, potassium dose can be increased to 80 kg/ha.

Name of the Fertiliser	Dose (kg/ha)	N-P_2O_5-K_2O - Ca(kg/ha)
Di-Ammonium Phosphate	75 kg	13.5 - 34.5- 0
Calcium nitrate	50 kg	8 – 0 – 0 -9.5
Ammonium Sulphate	180 kg	37.8 -0 - 0
Sulphate of Potash	120 kg	0 – 0 - 60
Sulphate of Potash (Podili)	150 kg	0 – 0 - 80
Total		60- 35- 60 to 80 -9.5

* As the soil test values for phosphorous are high in its range, accordingly the phosphorous dose was revised. This recommendation will be reviewed after two years.

Southern Black Soils (SBS) : The fertilizer dose recommended for SBS is 60-50-50. Two options were suggested to meet the nutrient requirement.

Option 1

Name of the Fertilizer	Dose (kg/ha)	N-P_2O_5- K_2O (kg/ha)
20-20-0	250 kg	50 – 50 - 0
Ammonium Sulphate	50 kg	10 – 0 - 0
Sulphate of Potash	100 kg	0 – 0 - 50
Total		60 – 50 - 50

Option : 2

Name of the Fertiliser	Dose (kg/ha)	N-P_2O_5-K_2O (kg/ha)
Ammonium Sulphate	200 kg	40 – 0 - 0
Di- Ammonium Phosphate	100 kg	18 – 46 - 0
Sulphate of Potash	100 kg	0 – 0 - 50
Total		58 – 46 -50

Northern Black Soils (NBS) : For NBS, the recommended dose is 45-0-0. Adhoc recommendation of a maintenance dose of P_2O_5 & K_2O @ 25 kg/ha each is recommended. Two options were suggested to meet the nutrient requirement.

Option 1

Name of the Fertiliser	Dose (kg/ha)	N-P_2O_5- K_2O (kg/ha)
20-20-0	125 kg	25 – 25 - 0
Ammonium Sulphate	100 kg	20 – 0 - 0
Sulphate of Potash	50 kg	0 – 0 - 25
Total		45 – 25 - 25

Option : 2

Name of the Fertiliser	Dose (kg/ha)	N-P_2O_5- K_2O (kg/ha)
Ammonium Sulphate	175 kg	35 – 0 - 0
Di- Ammonium Phosphate	55 kg	10 – 25 - 0
Sulphate of Potash	50 kg	0 – 0 - 25
Total		45 – 25 - 25

FCV tobacco Growing areas of Karnataka

Nutrient Recommendation	60 Kg N: 40 Kg P2O5: 120 Kg K2O/ha		
	N	P2O5	K2O
First dose at 10 DAT	30 kg	40 kg	60kg
Second dose at 30 DAT	30 kg	-	60kg
Fertilizer Recommendation			
First dose	Di Ammonium Phosphate (DAP)		87 Kg /ha
	Ammonium Sulphate (AS)		70 Kg /ha
	Sulphate of Potash (SOP)		120 Kg/ha
Second dose	Ammonium Sulphate (AS)		150 Kg /ha
	Sulphate of Potash (SOP)		120 Kg/ha

Bidi and Pikka tobacco: *Bidi* tobacco is cultivated in Gujarat and Karnataka in 1.15 lakh ha area while *Pikka* tobacco is an important tobacco cultivated in Orissa for chewing and cheroot purposes. Important production technologies recommended for *Bidi* tobacco cultivation in Gujarat and Karnataka and for *Pikka* tobacco in Orissa are furnished in Table 2.

Table 2: Crop production practices for *Bidi* and *Pikka* tobacco in India

Cultural Practice	Bidi Tobacco		Pikka Tobacco Orissa
	Gujarat	Karnataka	
Variety	Anand119, Anand 2, GT-4, GT-5,GT-7,GT-9,GTH-1, GTH-1 (MR)	A-119, NPN 190, Spoorthy Bhavya Sree NBD-43	Pyruvithanam, J.P.1, NG-74, II-1327
Preparatory Cultivation	Deep Ploughing in summer	Deep Ploughing in summer	Deep Ploughing in summer
Organic Manures (tonnes/ha)	Green manuring or FYM @12.5 or poultry manure or Azolla	FYM @10	FYM @10
Date of planting	August	10-25 August	2nd Fortnight of August
Spacing	90 x 60 cm	100 x 75 cm	75 x 50 cm
Planting method	Flat planting	Flat planting	Flat planting & ridging
Method of fertilization	Plant row - plough furrow method	Deep placement before planting	Band placement
Fertiliser dose (N:P2O5:K2O kg/ha)	160:0:0	125:60:40	80:40:40
Irrigations	As and when required	3-4 irrigations	Nil
Intercultural operations	As and when required	2-3 times	Two hoeings & hand weeding
Level of topping	18-24 leaves	16-20 leaves	10-12 leaves
Sucker control	Decanol 4-6% & hand removal	Khudaband 4-6% or Stomp 1.5%	Decanol 4% & hand removal
Harvesting	When leaves develop spangles	When maximum no. of leaves develop spangles	Stalk cut method
Curing method	Sun - curing	Sun - curing	Sun - curing
Grading	*Bukha, Geran, Galia, Lankada*	I sort, II sort *etc*.	----

Burley, *Natu* and *Lanka* tobaccos: In Andhra Pradesh, Burley, *Natu* and *Lanka t*obaccos are cultivated to an extent of 45,000 ha. The Important recommended production technologies for these tobaccos are given in Table 3.

Table 3: Crop production practices for Burley, *Natu* and *Lanka* tobaccos in Andhra Pradesh.

Cultural Practice	Burley	Irrigated Natu	Rainfed Natu	Lanka
Variety	Burley-21 and Banket A1	Kommugudem, Peddavithanam, Pyruvithanam, Rangapuram	Tokaku, Viswanath, Natu Spl., Prabhat, WAF, Bhairavi	Lanka Spl.
Preparatory Cultivation	Deep Ploughing in summer	Deep ploughing in summer	Deep ploughing in summer	Deep ploughing in summer
Organic manures (tonnes/ha)	FYM @ 10	FYM @ 10 –12 or green manuring	FYM @ 15	FYM @10
Date of planting	Mid-July to mid-August	Second to last week of October	Mid-Oct. to 1 week of November	Last week of Oct. to 15th Nov.
Spacing	90 x 45 cm	60 x 60 cm	90 x 90 cm	60 x 60 cm
Planting method	Ridge planting	Flat planting followed by ridging	Flat planting	Flat planting followed by ridging
Method of fertilization	Dollop	Dollop	Plough furrow	Dollop
Fertiliser dose (N: P2O5: K2O kg/ha)	125:50:50	350:50:100	80:50:50	300:50:50
Irrigations	Monsoon crop	6-8	Rainfed	3-4
Interculture	2 – 3 times	2 – 3 times	2-4 times	3-4 times
Level of topping	No topping	14-16 leaves	14-16 leaves	12-14 leaves
Sucker control	----	Decanol 6%	Decanol 6%	Decanol 6%
Harvesting	Priming	Stalk cut (katta) or priming (Thoranam method)	Priming	Stalk cut
Curing method	Air-curing	Air-curing	Air-curing	Air-curing
Grading	Flyings, bottom, middle and top	Melmi & Gulla	Bright, brown, dark brown, green and perished leaf	Kotaku, Baraku Mattasam and Gulla

Cigar & Cheroot, Chewing, Hookah and HDBRG Tobaccos: Chewing, cigar and cheroot tobaccos are the major types grown in Tamil Nadu. Chewing tobacco is mainly grown in West Bengal, Bihar, U.P. & Assam, while hookah tobacco is cultivated in U.P.,

Bihar, Gujarat, Haryana and Assam. HDBRG tobacco is mainly cultivated in black soils of Guntur district in Andhra Pradesh with 3 – 4 irriagations which is used in cigarette blending.

Table 4: Crop production practices for in Cigar & Cheroot, Chewing, Hookah and HDBRG Tobaccos in India

Cultural Practice	**Cigar & Cheroot - Tamil Nadu**	**Chewing- Bihar, Tamil Nadu & West Bengal**	**Hookah- West Bengal**	**HDBRG- Andhra Pradesh**
Variety	O-K.1, Bhavani Spl., Olor-10, I-737, Sangami	Bihar : Vaishali Spl., Sona, PT-76, Lichchavi West Bengal: Podali, Chama Tamil Nadu: Bhagyalakshmi, Meenakshi, Abirami, Kaviri, Meenakshi (CR)	DD-437 and Dharla Sonar-Motihari, Manasi	HDBRG
Preparatory Cultivation	4-6 ploughings in Kharif	Deep ploughing in summer	Deep ploughing in summer	Deep ploughing in summer
Organic manures (tonnes/ha)	FYM @ 25 or sheep - penning	FYM @ 25	FYM @ 20	FYM @ 10
Date of planting	Mid-Oct., to Mid-Nov.	Bihar & Bengal: Mid Sept. to mid Oct. T.N. Last week of Oct. to end of Nov.	Mid October to 1st week of November	1st week of Oct., 1st week of November
Spacing	Cigar: 70 x 50 cm Cheroot: 60 x 45 cm	Bihar: 90 X 75cm Bengal: 90 x 45 cm T.N. 65 x 65cm	Jati: 90 x 90 cm Motihari: 60 x 45 cm	80 x 50 cm
Planting method	Ridge planting	Ridge planting	Flat planting followed by ridging	Flat planting
Method of fertilization	Dollop	Dollop	Pocketing	PRPF
Fertiliser dose (N: P2O5: K2O kg/ha)	100:50:100	Bihar:250:60:60 Bengal: 120:50:75 T.N:100:50:0	120:50:75	100:50:50
Irrigations	20	Bihar :3 Bengal: 2 Tamil Nadu: 22	2	2-3

Intercultural operations	2 – 3 times	2 – 3 times	4 - 5 times	2-3 times
Level of topping	14-16 leaves	Bihar: 14 –16 leaves Bengal: 8-10 leaves Tamil Nadu: 10 leaves	8 – 10 leaves	20 leaves
Sucker control	Decanol or Royalten 6%	Decanol or Royalten 6%	Decanol or Royalten 6%	Decanol or Royalten6%
Harvesting	Stalk - cut	Stalk - cut	Priming	Priming
Curing method	Sun-curing	Sun-curing	Air-curing	Sun-curing
Grading	Plant position (*Rasi & Kruz*)	Bihar:1 , 2 , 3 & 4 grades T.N: *Rasi & Kruz*	*Panpatta* No.1, *Niras &Jalapatta*	Bottom, middle &top primings