

**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 ₂ O ₅ : K ₂ O 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% | C-10 fatty alcohol Decanol or Royalten 4% followed by hand desuckering | C-10 fatty alcohol Decanol or Royalten 4% | C-10 fatty alcohol Decanol or Sucker out or Royalten 4% |

| | | | | |
|---------------|-----------------------|------------------------|-----------------------|------------------------|
| 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 |

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

Northern Light Soils (NLS)

| | Name of the Fertilizer | Dose (kg/ha) | N - P ₂ O ₅ - K ₂ O -Ca (kg/ha) |
|-------------------|------------------------|--------------|--|
| Basal application | Dolomite | 200 kg | 0 - 0 - 0 - 48 |
| I Split/ha | Di-Ammonium Phosphate | 100 kg | 18 - 46 - 0 - 0 |
| | Sulphate of Potash | 100 kg | 0 - 0 - 50 - 0 |
| II Split/ha | Ammonium Sulphate | 250 kg | 51 - 0 - 0 - 0 |
| | 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 | | | 115 - 46 - 150 - 48 |

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

- As the soil test values for phosphorous are high in its range, accordingly the phosphorous dose was revised.

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 ₂ O ₅ - K ₂ O - 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 - 9.25 |
| | 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 ₂ O ₅ -K ₂ O - 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.

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 ₂ O ₅ - K ₂ O (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 ₂ O ₅ -K ₂ O (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 P₂O₅ & K₂O @ 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 ₂ O ₅ - K ₂ O (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 ₂ O ₅ - K ₂ O (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

- The fertilizer doses recommended for Karnataka Light Soils is 60- 40-120 (N-P₂O₅-K₂O/ha). Fertilisers are to be applied in two splits at 10 and 30-35 days after transplanting

| Fertiliser schedule for KLS | | | N-P ₂ O ₅ -K ₂ O-Ca (kg/ha) |
|---|-----|--------|--|
| 1st split (30:40:60) 10 days after planting | DAP | 100 kg | 18-46-0-0 |
| | AS | 60 kg | 12-0-0-0 |
| | SOP | 120 kg | 0-0-60-0 |
| 2nd split (30:0:60) 30-35 days after planting | AS | 150 kg | 30-0-0-0 |
| | SOP | 120 kg | 0-0-60-0 |
| Total | | | 60-46-120-0 |

- For calcium nutrient supply, either dolomite @75 kg/ha or calcium nitrate @75 kg/ha can be applied in light textured acidic soils. If calcium nitrate is opted, other fertilizer nitrogen doses are to be adjusted accordingly
- A starter dose of calcium nitrate @ 25 kg N/ha and foliar nutrition with N and K through potassium nitrate @2.5% at 45 and 55 days after transplanting improves productivity during moisture stress condition

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 | <i>Bukha, Geran, Galia, Lankada</i> | I sort, II sort etc. | ---- |

Burley, *Natu* and *Lanka* tobaccos: In Andhra Pradesh, Burley, *Natu* and *Lanka* tobaccos 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 15 th 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: P ₂ O ₅ : K ₂ O 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 irrigations 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 1 st week of November | 1 st week of Oct., 1 st 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: P ₂ O ₅ : K ₂ O 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 (<i>Rasi & Kruz</i>) | Bihar:1 , 2 , 3 & 4 grades T.N: <i>Rasi & Kruz</i> | <i>Panpatta</i> No.1, <i>Niras</i> & <i>Jalapatta</i> | Bottom, middle & top primings |