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**Course name :**

**Crop Production Technology-II  
(ASAG 2204)**

**Course credit :**

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**Lecture 18**

**Topic: TOBACCO**



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# TOBACCO

## *Nicotiana spp.*

- Important **cash crop**.
- Grown for its **leaves** which are used as cured product.
- Smoked as pipe, cigar, cigarette, beedi or hookah used as snuff or chewed .
- China ranks **1<sup>st</sup> in world flue cured tobacco production, followed by Brazil (2<sup>nd</sup>) and India (3<sup>rd</sup>)**
- It provides employment potential annually in cultivation, curing, grading, factories and cottage industries.
- **Nicotine sulphate**, an industrial product, used as **insecticide**.



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## 1.1 ORIGIN

- Types of tobacco presently being cultivated evolved in **Mexico and Central America.**
- In India tobacco was introduced during early part of 17<sup>th</sup> century by the Portuguese.
- The word 'tobacco' was originated from “**Tobago**”( **hollow tube**)

## 1.2 AREA AND DISTRIBUTION

- India ranks **2<sup>nd</sup> in production** after China.
- The principal tobacco growing states in the country are AP, Gujarat, Karnataka, Bihar, Maharashtra, WB and UP.
- 55 % of total production is from AP and Gujarat.
- India (2014-15): **Area 0.46 mha,**  
**Production 0.84 mt**  
**Productivity 1842 kg/ha**
- **CTRI: Central Tobacco Research Institute, Rajamundry**



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## 1.3 Botanical Classification Of Tobacco

- The genus *Nicotiana* is one of the five large genera of Solanaceae and is represented by about 68 recognized species.
- Description is available for all the 68 species, which are grouped in three sub-groups:
  - Sub-genus - *rustica*
  - Sub-genus - *tabacum*
  - Sub-genus - *petunioide*





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## *Nicotiana rustica*

Plants are usually taller with a height of 150-250 cm.

Leaves are large and narrow

Leaves may be sessile or petiolate

Flower colour is reddish, pinkish or white

Used for smoking and chewing purpose

Cross between *N.slyvestris* and *N.tomentosa*

## *Nicotiana tabacum*

Plants are usually bushy with a height of 90-120 cm.

Leaves are large , broad and ovate in shape.

Leaves are petiolate

Flower colour is dull greenish- yellow.

Used for hookah, chewing and snuff purpose.

Cross between *N.undulata* and *N.paniculata*





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## **1.4 CLIMATIC REQUIREMENTS**

- Tobacco is a tropical crop but can be grown under sub tropical conditions also.
- **Can germinate at 21<sup>0</sup> C temperature**
- **27-32<sup>0</sup> C for rapid uniform germination**
- **25<sup>0</sup> C for maturity**
- **Lower temperature increases the growth period and quality is reduced.**
- **High temp and hot weather conditions make loss of moisture from the tissues of the plant, leaves become thicker and aroma content is reduced.**
- Drought & low humidity affect the quality and yield adversely.
- Moderate drought throughout growing period produces **thicker leaves, dark colour, does not ferment well and inferior quality in terms of taste and aroma.**



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- Water requirement is very high.
- Rainfall is undesirable at the time of maturity as resins and gums of the leaf gets washed.
- Suffers severe injury from strong winds and hail.
- Tobacco plants are **very sensitive to flooded/water-logged** condition of soil because of deprivation of oxygen in soil essential for the development of a fibrous root system.
- Ideal conditions required for successful production of high quality leaf are:
  - 1) **A liberal and well-distributed rainfall during active vegetative growth stage**
  - 2) **Long day lengths and**
  - 3) **A high relative humidity of 70-80%.**



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## 1.5 SOILS

- Tobacco is adapted to moderately acidic soils with pH ranging from **5.5-6.5**.
- It will **not do well in water logged soils** as it is sensitive to water-logging .
- Tobacco from **low lying lands** has been found to be **very poor in burning quality**.
- Soil should be well drained, good content of **K, Phosphoric acid and iron**, poor in humus content.

### Soil requirement for Special type of tobacco

- **Heavy and naturally fertile soils:** cigar fillers, pipe, hookah and chewing type.
- **Light sandy and low fertile soils:** cigarettes, bidi, cigar wrappers etc.





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## 1.6 VARIETIES

**FCV tobacco:** Chatam, Delcrest, Kanakprabha, Dhanadayi, CTRI special, VT 1158, Kanthi, Siri, CM 12, McNair 12, Kachan, Virginia, Gauthami, Bhavya, Jayasri, Hema and Godavari special

**Bidi tobacco:** GTH 1, Keliu 20m, Anand 3, GTH 2 GT 7,GT 5, PL 5, Anand119 and Anand 23

**Natu tobacco:** Viswanath, Natu special, Bhairavi and Prabhat

**Cherut tobacco :** DR-1, Bhavani special, Sendarapatty special and Lanka special

**Wrapper tobacco:** Krishna banket A-1, S 5

**Chewing tobacco:** Vaishali Special, Chama, Podali, Gandak Bahar, Sona, Manasi, Meenakshi, Pusa tobacco 76, DP 401, Vairam, Thangam, Abirami, Prabha, Maragadham and Bhagyalakshmi

**Rustica tobacco:** DD437, Sonar Motihari, Dharla, GC 1, GCT 2

**Cigar Wrapper tobacco:** S 5, Krishna



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## 1.7 FIELD PREPARATION

- In all the tobacco growing soils, **deep summer ploughing** is invariably recommended.
- This practice is found highly beneficial in minimizing weeds and ***Orobanche*** menace, reducing insect **pest and disease** problems and **improving water and nutrient conserving capacity of the soil.**
- Pre-planting tillage operation includes **one or two ploughings with mould board or disc plough** followed by **two cross ploughings** with **cultivator** followed by **planking** for levelling the field.
- A **clean and well pulverized seed bed** of good tilth is needed for transplanting of tobacco seedlings.



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## 1.8 NURSERY MANAGEMENT

- Tobacco seeds are **very small** and egg-shaped with thick seed-coat.
- In *N. tabacum* the average weight of the seed is 0.08 to 0.09 mg.
- In *N. rustica* , the seed is larger and about three times heavier.
- The emerging seedlings are **tiny and delicate** and therefore, the seeds are **unsuitable for sowing directly in the field.**
- Hence, they are **sown in nurseries initially** and tended carefully till the seedlings attain a particular size before transplanting in the main field.
- For successful raising of nurseries, proper location, good preparation and manuring, adequate facilities for watering and timely controlling of pests and diseases are essential.



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## 1.9 SITE SELECTION

- Generally tobacco nurseries are grown on **sandy or sandy loam soils**.
- Raising of nurseries on **heavy black soils** is hazardous due to poor internal drainage due to clay content, heavy rainfall, high temperatures.



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## 1.10 STERILISATION

- The nursery site should have a **good internal** as well as **surface drainage** and should be situated at an elevated place.
- It is desirable to **change the nursery site every year** as it would **minimise incidence of pests and diseases** and also eliminate contamination by other varieties.
- If it is not possible to change the site, old site can be used after sterilizing by **rabbing**, i.e. by **burning any of the slow burning waste materials like, tobacco stalks, paddy husk, sugarcane-trash, etc.**





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- For the best results this should be done at the right moisture content, after the **final preparation of the seed bed and a few days before sowing.**

## **1.11 SEED BED PREPARATION:**

- The beds of **1.0 m to 1.22 m width** facilitate hand weeding and watering with rose cans.
- The beds can be of any convenient length along the slope but generally **not more than 10 m.**
- Mixing of sand at **100 to 200 tonnes/ha** in the preparation of the beds, helps in improving the drainage in heavy soils.



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## **1.12 MANURES AND FERTILIZERS:**

- 25 t/ha- FYM
- Basal application of 50 g of ammonium sulphate, 50 g of potassium sulphate and 300 g of super phosphate and 100 g of dolomite per 10 sq.m. bed is recommended.
- After germination of seed, top dressing of ammonium sulphate @ 25 g/10 sq.m. twice at 4 days interval and thereafter @ 50 g/10 sq.m. thrice at 4 days interval



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- potassium sulphate @ 25 g/10 sq.m. twice is recommended.
- After each pulling top dressing with ammonium sulphate @ 100 g/10 sq.m. is to be applied to boost the growth of remaining seedlings.



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## 1.13 SEED RATE:

- Optimum seed rate is **3-5 kg/ha** (0.4 g/sq.M).
- A seed-rate of **3 kg/ha** for *N. Tabacum* and **6 kg/ha** for *N. Rustica* was found to be optimum.

## 1.14 TIME OF SOWING :

- sowing for nursery is **2<sup>nd</sup> fortnight of August**.
- **1<sup>st</sup> 10 days of nursery period is most critical** and if the afternoons are hot, missing even one watering inhibit germination of seed.
- **A week to ten days before planting, seedlings are hardened by withholding water.** Such seedlings withstand the shock of transplanting better than normal seedlings.
- Seedlings of **pencil thickness and of 10 to 15 cm length** are normally preferred.



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- Normally, the seedlings are ready for planting by the end of **7<sup>th</sup> week** and in the **first picking 30 to 40%** of the total seedlings are available.
- The seed bed is top-dressed after each pulling to make the remaining seedlings grow to transplantable size.
- 5-6 waterings are needed on sunny day.

### **1.15 TRANSPLANTING :**

- In Andhra Pradesh, the normal period of planting is from **mid-October till mid-November.** (winter crop)
- **Early plantings** are damaged by **heavy rains** and **late plantings** suffer from **deficiency of soil moisture.**
- In case of **summer crop end of the march or 1<sup>st</sup> week of april.**





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## **1.16 METHOD OF PLANTING:**

- **Dry Planting**
- **Wet Planting**

## **1.17 SPACING :**

- Spacings recommended for various tobacco's in India
- Bidi Tobacco - 90cm X 60cm to 100cm X 75 cm
- Natu Tobacco- Irrigated - 90cm X 90 cm
- Rainfed - 60cm X 60 cm
- Burley Tobacco - 80cm X 40 cm
- Lanka Tobacco - 60cm X 60 cm



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## 1.18 Manures And Fertilizers :

- In general a normal tobacco crop removes 225 kg N, 17 kg P<sub>2</sub>O<sub>5</sub> , 365 kg K<sub>2</sub>O, 135 kg CaO and 17 kg MgO from 1 ha.
- Heavy manuring with nitrogen increases yield but quality will be reduced
- In chewing, bidi and hookah tobacco better quality heavy manuring of N+ other nutrients.
- Potash is important element, particularly for smoking tobacco.
- In heavy soils like vertisols and red clay loams, fertilisers are applied before planting in **plant row plough furrow (PRPF) method**.
- In this method, furrows are opened with a plough in the planting row and fertilisers are applied in the furrow and land is levelled with a plank. Later the planting is done on the same line which helps in better utilization of fertilisers.
- In light soils(sands to loamy sands), fertilisers are applied in two or three splits by **double band placement**.



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- **NUTRIENT MANAGEMENT**
- Bidi Tobacco : 160-0-0 kg N, P2 O5 and K2 O / ha. 125-60-40 kg N, P2 O5 and K2 O / ha.
- Burley : 125- 5-50 kg N, P2 O5 and K2 O / ha.
- Irrigated natu : 300-50-100 kg N, P2 O5 and K2 O / ha.
- Rainfed natu : 60-50-50 kg N, P2 O5 and K2 O / ha.
- Lanka : 300-50-50 kg N, P2 O5 and K2 O / ha.
- Cigar : 100-50-100 kg N, P2 O5 and K2 O / ha.
- Chewing : 120-50-75 kg N, P2 O5 and K2 O / ha.
- Hookah : 112-50-75 kg N, P2 O5 and K2 O / ha.



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