

CBT 25A (Field crop production)

* Arable crops: They are crops that last for one year e.g. cassava, cassava, millet, etc.

Cereals are grain like crops.
- they are always grass-like
- they are erect

* Yam is a tuber crop, not a root crop.
Legumes have broaded leaves.

LEGUMINOUS CROPS

These are crops that have nodules that can fix nitrogen. They have broaded leaves.
- they are not erect
- they are arable crops.
- they have tap roots

Groundnut

There are two types of groundnut namely:
- Ered groundnut: they are from the roots produce the buds.
- Spreading groundnut: they produce roots at its joints which vegetate the buds.
- When they spread joint to enable it produce seeds.

* In ered, the branches always with the plant without bearing.

* Ered groundnut can as tall as 25-30 cm height.

- The flowering season is about January because it needs more soil.

- The resistant crop: these are crops that are resistant to frostights. They are grown in the far North.

- They are found in Northern Nigeria and Southern America.

- They are planted in a well-drained sandy loamy soil - they require loose soil for proper harvesting to avoid being washed away.

- If the air movement is not free, the buds have tendencies of being infected.

- The lands are not ploughed, rather the seeds are.

- They are not planted on ridges, rather the seeds are on flat beds.

They require minimum tillage. They are planted on beds.

* Planting of groundnut on ridges is not advisable because when it rains, the buds are exposed and washed away by rain. It is also not advised because when the lands

are exposed ~~and washed away by~~ when it rains bacteria are attached to the buds.

- Weeding from legum in the crops is important.
- Young seeds are planted.
- Maturity is known through the leaves its leaves is meant to be yellowish brown for 15-20 weeks of planting.

- Harvest is done manually.
- The soil must be loose.

* Post harvest practices: They are things that happens after harvest.
- The nuts are detached from the grass.
- Wash & dry.

- Dry properly before packing.
- Separate the good ones from the infected ones.

- Then, shell properly.

Diseases that affect groundnut plants:

- Leaf blight disease.

- Nodulation disease.

- Groundnut rot.

- Groundnut leaf blight.

- Root & stem rot.

- Leaf spot.

- Aflatomin' fungus.

Pests: beetles, aphids, groundnut hopper.

- *Acanthoscelides obtectus* (Botanical name).

Witch crops and cereals, legumes & tubers that normally last one year

Spreading groundnut produces more buds than ered, but should be covered with soil for fully developed roots. They are annual crops (lasts only one year).

Ered groundnut for 25-35 cm in height just that they don't bend.

Spreading groundnut is also known as the RUNNER GROUNDNUT.

Groundnut has different species found as both ered & runners.

Groundnut are mainly grown in the northern part of Nigeria due to its intense climate and resistance to drought.

They are seasonal in nature.

Drought: It originates within Northern Argentina and the southern part of America.

Groundnut should be grown in a well-drained sandy soil for easy harvesting of the buds.

Planting Method: It is propagated by seeds. It is not planted on mounds or ridges, but on a fall

Feb 10/20
Surface (beds) this is because when it rains, it forms a mud soil which bags over bubbles & smoothes out, soils improving feeding is important and should be done regularly. Fertilizer is not necessary except for growing effects in 200kg/ha. Planting duration is 15-20 weeks. Harvest is done manually.

Post harvest handling

- Detach the nuts from the plants & wash thoroughly before storing.
- After drying the nuts storage can be with or without the shell.

Uses

- Serves as edible food.
- Processed as groundnut oil.

WINGED BEAN 10/20/20

It possesses the same characteristics as groundnut but the only difference in winged bean is that its pods are seen on the surface. It has fibers & lands that are edible. Pod production is for one year but for tubers, it is perennial which includes tuberization, growth & development. Like other leguminous crops, they are cultivated during the early season or late season of rainfall i.e. limited rainfall. Origin: Africa, Madagascar, Nigeria, Ghana.

Production

Site selection - Growing but winged bean is a climber & it cannot be supported by staking or using shrubs instead of staking. Soil requirement - It requires well drained sandy loam which is always tilled & flat surface is preferred to an undulating surface encourages surface erosion. Water logging area is discouraged so as to reduce disease & pest infestation and poor aeration of water run-off due to no pores left.

Fertilization - The ability to fix Nitrogen in the soil is an advantage to the farmer but due to soil composition, addition organic manure can be addition. Excess nitrogen improves & increases the vegetative parts of plant rather than the pods when using inorganic

fertilizers when performing soil amendment for seed production, increase phosphorus rate in the soil. The act of producing forage is called Interculture production for animal farming.

Seeds rate: 500kg/ha of seeds per ha

1m x 1m or 1m x 75cm

If should be planted on ridges harvesting; first weeding between 3-4 weeks of each crop is very important.

Proper harvesting makes no proper storage there's no continuity.

Early maturity is within 45 days according to species (Harvest report)

Signs of maturity

- Light yellow to brown pod are signs of maturing.

- Black leaves turns yellow.

Don't harvest disease infected pods & remove before rains so as to avoid seeds growing moulds in the store.

Methods of harvesting for leaves, foliage:

use shears or secateurs or use knife & sun dry for seeds, 45 days.

Cuts from the point of attachment - Don't cut when the pods are ripe or dry harvest when fully brown & detach from the stalk. Go with a basket. Stop when moisture content go low to avoid mould growth when kept in the store.

Proper harvesting makes tomorrow and if there's no proper storage there's no future.

Note: Yellow coloration of leaves may not be the only signs of maturity but in disease the break leaves turn yellow.

Things to do at harvesting time:

1) Don't harvest infected pods.

2) Don't harvest when rains have set in.

3) Harvest when the crops have attain physiological maturity i.e. the stage at which the seeds are fully matured when it is eaten fresh.

Note: Moulds management signifies old leaves with weeds for the presence of pest.

26/06/2018

WHEAT (*Triticum aestivum*)

Wheat is a temperate region cereal but it is grown in some tropical and sub-tropical regions. It is grown in dry season using irrigation. It can be grown under different temperatures but its ideal temperature is $18-25^{\circ}\text{C}$. Higher temperature over stimulates the development of wheat thereby reducing its yield. But at temperatures above 27°C there is disease increase. At this point, the pollen grains of some of the wheat stalk becomes sterile, thereby, there would be no pollination.

Water requirement: This depends on cultivars, 250-360 mm with cool weather - whereas, high yielding varieties need 400-950 mm of water during the vegetative period. If the humidity is not too high, warm humid areas encourages the outbreak of diseases when growing wheat.

Soil types: It can be grown on a variety of soil but mainly loamy soil, neutral to slightly acidic with reasonable drainage and good water holding capacities based on the different gluten standards. Wheat is divided into several groups. They are;

Hard wheat.

Semihard wheat.

Soft wheat.

Cultivation of wheat: The seed bed should be clean and free from weeds before cultivation. This is just to wheat is sown broadcast (spreading out) some farmers however cultivate by making holes on the bed with their fingers. It is planted at a seed rate of 160-125 kg per hectare and with this, you can get a high yield after harvest. It is a free till stage.

It's height is 0.3-0.8 m tall. It has semi-erects of 3-6 number followed by a ventricle rosette that forms at the base (from the basal nodes). The emergence of seedling takes 5-7 days after planting. After it emerges, the plant comes from a main stem which records the growing point which contains the stamens (nodes) and internodes. The wheat head carries the

nodal bulb on older wheat stands. The number of florets is determined by the;

- 1) Seeding rate
 - 2) Soil moisture & fertility
 - 3) Temperature and variety.
- Tillers develop soon after the seedling emerges from the soil. It will have all the other growth stages of the main stem. Tillering can be encouraged by;

- 1) Planting density
- 2) Fertilizing with Nitrogen.

3) If soil moisture is low, by irrigating. Late planting reduces tillers but can be improved or increased by higher seed rate planting.

Jointing: This is a development of nodes & internodes that forms a stem of the wheat plant. It begins when the growth of the tillers is complete. This phase marks the change from vegetative growth to reproductive growth. Flowering does not occur until the plants have been exposed to winter temperature & spring growth. Without this exposure, the plant will continue to produce more leaves.

Heading: Here, the spike emerge from the boot. The head is enclosed in a flat leaf at the top of the plant. Within 1-7 days after heading the flowering & pollination stage occurs and then grains begin filling. Most plants including wheat has very specific day (day length) requirement for flowering. Wheat is classified as a long day plant because it will flower only when days are long & nights are short. The grain begins growing after flowering and reaching its maximum size in about two weeks - wheats usually ripens after about 30 days after the development of the florets (after the floret is blown).

Storage: When completely air-dried, the moisture content should be about 10-12% at this level, the grain can be stored safely. On a small scale, threshing is done by the threshers.

Winnowing: is the procedure of separating the grain from the chaff. Cleaning the storage bags with insecticides and fumigation of the grain soon after storage is very essential.

Pests & diseases of Wheat

Pests: **Wheat aphid** - They feed and damage the

long leaves & inflorescence - At the same time they transmit wheat virus. They are controlled by spraying phosphorous insecticides.

Wheat stem borers - They cause serious damage to the stem by laying eggs inside the stem causing them to split open and it leads to lodging. It is controlled using resistant varieties & crop rotation.

stem rust (Rice & Gramineae) - This disease attacks all cereals & grasses. It produces black spots on the stem. Red brown elongated pimples on the leaf surface. The grains will become shrivelled. To control, resistant varieties. If occurs mainly during dry & cloudy weather.

Cut worms - These are caterpillars (they start damaging the crop as soon as they emerge from the eggs). They remain in the soil during the day (night), feed come out in the evening to cut the plants and feed on them. Control - Soil treatment with 5% alorite at 25kg per hectare. This is done at the point of land preparation.

Loose smut - It cannot be detected until the plant starts flowering. If affected, the grain and it starts to swell. Thereby, causing the stalk becomes black.

Seed treatment (Immerse the seeds in hot water for about 2 hours. Drain for a few minutes and submerge them in tank of warm water for 10 minutes.) Note: The temperature of the warm water must be between 52-54°C. This method is warm water treatment and it is very effective.

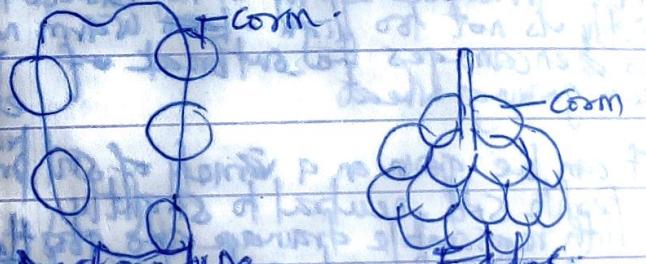
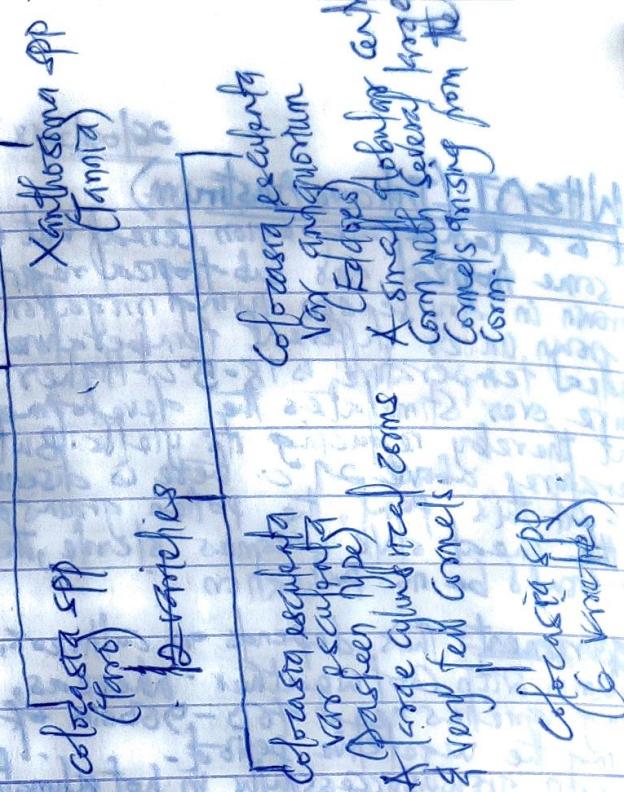
Uses of wheats:

Apart from human nourishment, wheat is used for:

- 1) Animal feeds
- 2) Forages

COCOYAM (*Cocoyasina spp*) Xanthosoma spp

Family: Araceae
Cocoym offers from yam. It is not a tuber, it is a corn.



Dashen type

Fodder

Environmental Conditions for growth:

Rainfall - Cocoym has high requirement for moisture about 250cm rainfall per annum. This may be due to their large transpiring surface. Dry conditions results to reduces corn yields.

Temperature - Cocoym thrives well in warm climate and requires an average temperature above 28°C. This is probably due to its temperature sensitivity. It is essentially a low land crop so when grown at high altitude region, it to produce low yield.

Yield of Cocoym

The highest yield of "Taro" are obtained full sunlight intensity though, they appear to be more shades tolerate than most other reasonable yields can be obtained even in shade conditions when other crops have failed.

Sunlight - It also affects the growth & development of cocoym. The development of corn is promoted by short day conditions. Flowering is promoted by long day conditions. "Taro" tolerates waterlogging while does not tolerate waterlogging.

Forage; Fresh plants ruminants feed on.

Dried plants/grasses.

Starter; Kept in anaerobic conditions with additives in syrups to supplement loss in nutrient used to feed ruminants.

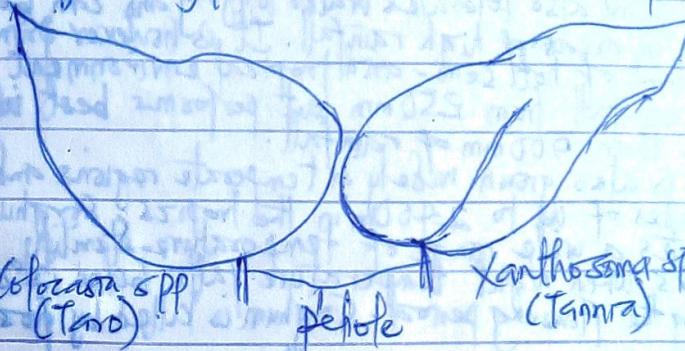
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or left in the soil after maturity & harvest. If harvest is delayed, they won't re-sprout or regrow quickly - Coxoyam can be stored up processed forms. They can also be stored in baskets.

18/07/2020
PMH

Diseases affecting Cocoyam;
Distinguishing features between the two species.



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Seed

N.H.T

g
g

SORGHUM (Koring)
Scientific name: *Sorghum bicolor*.
Family: Cyperales Poaceae

03/07/2018

In Africa, the major growing area of Sorghum runs across West Africa, South of Sahara, S.E. to the Coast and eastwards to the Sudan, Ethiopia & Somalia. It is grown in Upper Egypt but it is also a minor crop along the North African Coast. It is commonly grown in Uganda, Kenya, Tanzania, Rwanda and Burundi and is fairly important in Zambia, Malawi and the drier areas of Mozambique.

Sorghum is perhaps the world's most versatile crop. Utilization; Some types of Sorghum are boiled like rice, some are cracked like oat for porridge, some are malted like barley for beer, some are baked like wheat into flat breads and some others are popped like popcorn for snacks.

A few types have sugary grains and are boiled in the green stage like sweet corn. The whole plant is often used as forage, hay or silage.

The stems of some types are used for building, fencing, weaving, broom making and firewood. The stems of some other types are used for sugar, syrup and even liquid fuel for vehicles & cooking.

The living plants are used for windbreaks, cover crops and for staking yams and some other climbers (beans).

The seeds are also fed to poultry, cattle and swines and also used by man.

The planting materials may be:

1) Small Corms or Setts from Corms.
2) Small Cormets or Setts from Cormets.

3) Stem cutting (apical portion).

Planting materials can be utilized using the following methods; there are three methods:

1) Removal of the apical dominance.

(Buds begin to form around the corm).

2) The lateral buds can be excised, cut off and grown separately.

3) By meristomizing them, the lateral buds of the Corm are cut & grown in separate pots culture. It then differentiates into mass of cells which can be grown into a field.

spacing; A spacing of 60 x 100 cm is recommended for Coxoyam. Close spacing will give higher yields per hectare but it will decrease a plant yield per plant and size of the corm. In close spacing, light incidence is lower.

Taro requires closer spacing than Tannia. As Tannia requires wider spacing.

Planting depth; Coxoyam setts are placed 5-7 cm deep in the soil - shallow planting should be avoided to prevent shallow rooting that exposes the plants to the sun, frost and damage by pest. It is advisable to cover the planted setts with dry soil to conserve moisture and reduce the temperature around the setts.

Weed control; Coxoyams are sensitive to weed competition during the 3-4 months after planting. Manual weeding is required about 3-8 weeks after planting. There is need to be very careful "Taro" roots are very shallow and the roots of "Tannia" are deep.

Harvesting; They are ready for harvesting when the leaves turn yellow. The time of planting to harvesting differs from different cultivars. It may be harvested 5-12 months after planting. It has to be done during the dry season when the roots are dead. So that, digging can be easily done.

Storage; Coxoyams can be best stored in cool, dry and well ventilated surroundings. The best temperature for storage is about 17°C.

Relative humidity: 85%

Coxoyams can be stored in craters or raised platforms and swings and also used by man.

* Sorghum possesses the ability to grow in saline areas.

Climatic requirements: Sorghum is adapted to quite a wide range of environmental conditions and will produce significant yields under conditions that are unfavorable for other cereals.

- Sorghum is particularly adapted to drought.

- Sorghum can survive drought conditions for some weeks by rolling up its leaves to reduce transpiration.

- Sorghum also tolerates waterlogging and can be grown in areas of high rainfall. It is however a dryland plant of hot semi-arid tropical environment with rainfall from 250 mm but performs best with more than 900 mm of rainfall.

- It is also grown widely in temperate regions and at altitudes of up to 2450 m in the tropics. Sorghum tolerates a wide range of temperatures. Sterility occurs when night temperature falls below 12°C during the flowering period. Sorghum is killed by frost.

Soil and water management: Sorghum can be grown successfully on a wide range of soil types. It is also well suited to heavy clay soils (vertisols) commonly found in the tropics where its resistance to waterlogging is often required but is equally suited to light sandy soil. It tolerates a range of soil pH from 5.0-8.5 and is more tolerant to salinity than maize. It is adapted to poor soils and can produce grain on soils where many other crops would fail.

Propagation and planting: Sorghum is normally grown by seeds. A fine seed bed is preferable but often not achieved. The seed is usually sown directly into a furrow after ploughing, but can also be broadcast and harrowed into the soil. Optimum plant spacing depends on soil type and the availability of moisture. For favorable conditions, row spacing of 45-60 cm and plant to plant spacing of 12-20 cm, giving populations of about 20,000 plants per hectare are normal for drier field conditions, wider spacing and lower plant populations are usually optimal.

The seed rate varies from 8 kg/ha in very dry areas to 10-15 kg/ha under irrigation. Occasionally, seedlings are grown in nursery and are transplanted into the field early in the dry season on the flood plain of the lake Chad in Africa.

Growth requirements: Sorghum is usually grown as rainfed crop, sown after the onset of the rainy season. Sowing rates are often higher than optimum to compensate for poor seed-bed or to allow

unfavorable weather condition. All sorghum varieties require a fine seed bed for better seedling establishment. If tools are used to open up a shamba, it is unsuitable to harrow after the first ploughing. When hoes are used for land preparation, farmers are advised to ensure that lumps of soil are reduced by breaking them to form smooth seed bed.

The planting field should be prepared in advance of sowing. Seed rate is 7-10 kg/3-4 kg/acre. Dry planting is highly recommended, blunt before or at the onset of rain by either drilling in the morrow made by open ploughs, or hill plant in the holes made by the hoes. When dry planting, planting depth is 5 cm but when planting in a moist soil use planting depth of 2.5-4 cm. Common row spacing is 75 cm and distance between plants about 20 cm. In semi arid areas, the recommended row spacing between plants is about 95 cm. Farmers rarely apply fertilizers, as less dependence on moisture availability, which is very certain.

Under more favourable conditions, farm manure is used with advantage, but except the months need are usually low. Optimum sorghum needs top quality of 20 kg N/m² and 20 kg P/kg at planting which can be supplied by alternate cropping techniques and application of compost or manure. Also, intercropping with legumes is recommended with grain legumes such as beans, cowpeas and green gram. Manure and compost are organic matter content of the soil, and more retention ability and soil structure.

Manure can be broadcast in the field before planting furrows and mixed with soil. Seeds are planted - the stems are from wheelbarrow when full holds approximately of dry manure compost. At a ton rate, two wheelbarrows are enough for a 10 m area.

This divides into 200 wheelbarrows 5 tons/ha. When aiming for high rate, 400 wheelbarrows of 10 tons per hectare crop is usually needed by a combination of cultivation with animal drawn implements and hand weeding within rows. Thinning out at the same time as hand weeding at intervals during the crop cycle.

lately where thinning are used to feed livestock. Grafting by backplanting thinning is encouraged when thinning is done within 2 weeks after the emergence and when the soil is moist.

Sorghum ratclipping: Ratclipping is a practice of getting more than one harvest from a single sowing. Two ratclipping systems have been identified. One of the bimodal rainfall zones in semi-arid lowlands giving two crops and the other in the most mid altitude coffee zone where the local varieties are the two seasons ratclipping type. A ratoon crop compared to a newly sown crop has an established root system which will utilize the available water in root zone for crop growth early in the season, reduce ploughing and planting labour and avoid migratory work base in August by maturity early.

Sorghum is planted in short rains (October - November). When the crop is mature, it is harvested in February and immediately sown to take advantage of the long rain season which starts in mid-March.

To achieve good yields, the crop is thinned to 2-3 tillers per hill. Weeding and other management practices are done as for a newly sown crop.

Harvesting: Sorghum is usually harvested by hand when it reaches physiological maturity which means the grain is hard and does not produce milk when crushed. Cut the heads with sickles or a sharp knife from plants in the field or cut the whole plant and remove the seed later. Sun dry the harvested sorghum to a moisture level of 12-13%, thresh and store the grain.

Pest: ① Striga which weeds (striga hermonthica) is a parasite weed. Striga is a major pest of sorghum, especially in Africa, where it is the leading cause of yield loss. It attaches itself to sorghum roots, depriving plants of nutrients and preventing them from establishing and growing properly.

Control: Striga can be controlled mainly by weeding before it produces seeds or by intercropping sorghum with fast growing legumes which deprive the weeds of cane which is largely grown in tropical countries and which exude chemical substances that reduce striga growth. Desmodium for instance, The remaining 20% is produced from sugar beets.

has been shown to depress striga almost completely. Considerable efforts have been dedicated to developing resistant varieties. Some of the varieties have developed resistance in Africa are "Dobbs", "SAR 1 to 3A", "L-1872", "IBSV 1002", "SRN", "Fransda" and "IS 938".

SUGAR CANE

Botanical name: *saccharum officinale*.

Eugarcane has two wild species which are:

- *saccharum spontaneum*

- *saccharum robustum*.

and four cultivated species which are:

- *saccharum officinale*

- *saccharum barbense*

- *saccharum sinense*

- *saccharum edule*.

Origin and distribution of sugar cane

Sugarcane most likely originated in New Guinea.

It is only suited for tropical regions with favorable climate and cool - dry seasons. It is called goat.

Production level: Sugarcane is the world's largest

The parasitic weed striga is a major pest of sugarcane, especially in Africa, where it is the leading cause of yield loss. It attaches itself to sugarcane roots, depriving plants of nutrients and preventing them from establishing and growing properly.

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Sugar cane → Tropics
Sugar beet → Temperate zones

2-5 cm makes 1 inch.

- which is grown mainly in the temperate zones of the northern hemisphere.
- climate & soil requirement; sugar cane grows best in warm, sunny and frost free weather areas. It requires a tropical or sub-tropical climate with a minimum of 600mm of ^{annual} rainfall.
- However, it grows well in a sub-tropical climate where temperature ranges from 20°C - 35°C .

Optimum temperature for germination of stem cuttings is 32°C - 36°C . Sugar cane is a long day plant in that, it responds to a long period of sunlight of about 12 - 14 hours. High humidity and consequently increase yields. Fertility (80-85%) favours rapid cane elongation. 2,4-D should be applied, but cane should be taken not to spray on the stem & plant on almost all classes of soil. glut, it prefers fertile well-drained soil - turned soil from 100-150 cm³ with good drainage are most suitable with a pH range from 6 - 7.7. Salinity may induce water stress.

Propagation; It can be done using stem cuttings or ring an insect that is indigenous to Africa which is obtained by cutting off sections of the stalks is a very active, stiff, brown, battery bores called "setts" or seed pieces. Other planting material that moves vigorously when disturbed. Stalk rats are killers (shoots developed from basal nodes) is a voracious feeder and it infests sever of stalk and ratoons (developed from stalks left after harvesting). This causes crop loss.

Land preparation; The soil should be left fallow control;
(1) Use recommended Insecticide:

② Biological control using predators such as ants, cockroaches, spiders & mice.

③ When planting, select stalks that shows no sign of borers alive.

④ Infested stalks/plants should be mulled or developed from the tops of Infested shoots/stalks burnt.

⑤ Sesamia borer (*Sesamia calamistis*). This of grass-like可抽芽的 shoots borer is the larva stage of an inconspicuous control, (1) plant resistant varieties moth. It is widely spread in the sugar industry (2) plant disease-free seed cane Although, it looks almost like eldana, thus (3) Burn affected fields and plough out severely borer is pinkish, less lively, does not move stunted plants backward and occurs in most sugarcane fields.

but is of seldom economic importance.

Control: (1) Natural control by parasites or predators

parasite serious outbreaks of Sesamia.

(2) Thilo borer (*Thilo shapariphagus*)

disease control: (1) Root rot/stunting disease the word "Nicotine" the major active nutrient.

(RS) can be a serious and often virus. Nicotine is a nutrient content which makes it a good source of low yields. It is caused by the bacterium "cladibacter xyli".

Symptoms: (1) Diseased plant becomes stunted. Allelopathy, A process whereby trees emit chemicals often giving the affected field an uneven appearance that scares away other plants growing around it.

(2) Red brown dots or streaks at the base of the nodes.

Control: (1) Plant only healthy seed cane.

(2) Sterilize cane using knives & harvester blades.

② Smut - It is a fungal disease of sugarcane caused by a fungus *Nectriella sativana*

Symptoms: (1) Dark brown whip-like structures usually

developed from the tops of Infested shoots/stalks

(2) Severely Infested stools degenerates into clumps

NLT

(1) plant resistant varieties

(2) plant disease-free seed cane

(3) Burn affected fields and plough out severely

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- China

- West India

- USA

The highest producer of tobacco is India during the 3-4 months growing period.

The highest consumer of tobacco is Jamaica. Not tolerate waterlogging and its usually.

Tobacco contains a stimulant called Nicotine due to variations in climate and soil conditions.

It is the alkaloid that induces human addiction. **Agronomic Practices**; **Seedling Production**, **Nicotinization** to tobacco. Nicotine is a strong entomocidal which discourages insects permanent water. Beds of 1.2m wide are from attacking tobacco plant.

It also deters most herbivores from feeding on them. Dried tobacco leaves are mainly used for smoking in cigarettes, cigars and pipe tobacco. They can also be consumed as snuff or chewing tobacco.

However, tobacco use is a very important risk factor for many diseases especially those affecting the heart, liver & lungs as well as many cancers.

The world's major producers of tobacco: - India (11%) - Brazil (10.7%) - USA (4.6%)

In Africa; Zaire, Malawi, Tanzania, Kenya and Nigeria contributes 0.60% to the world. It is the removal of fluorescent when flower.

Ecology; Tobacco is a tropical crop that begins to appear. This is to encourage further production are spread through 43 topics and development of leaves in both size & quality. Sub-tropics. The optimum temperature is 25-30°C. Moderate rainfall of 700mm is required done by repeated cultivation 4-6 times during

Transplanting; When seedlings are 10-15cm tall, they are planted to the soil with sufficient moisture at a spacing of (60-100 cm) laterally (30-60 cm) intra row.

Fertilizer application; Fertilizer rate of N at 40-100 kg/ha, P (Phosphorus) at 50-100 kg/ha, K (Potassium) 100-150 kg/ha.

Topping; Topping is similar to pruning.

the tobacco begins to produce fluorescent. This is the removal of fluorescent when flower.

Weed Control; This is necessary and should

be done by repeated cultivation 4-6 times during

the growing season.

Harvesting; the leaves are considered ripe completely oxidized away. It is a very 70-90 days after transplanting or 40 days slow process and only $\frac{1}{5}$ th of the world's after topping when the dark green colors of total output is air-dried or air-cured the blade becomes light with a whitening (soft) fire-curing; Read up!

the next note.

Harvesting can be done by removing the whole stalk or by pruning 1-3 leaves per plant at weekly interval.

Curing; this is the dry fermentation or oxidation process, depending on the method of harvesting and maturity of the leaves. There

are four types of Curing. (the major essence

of Curing is to reduce the level of sugar).

1) Flue-Curing - This is usually done in brick barns where heat from the small furnace is supplied through the flue (metal pipes). Temperature-

humidity and relative humidity are controlled

to achieve curing in 4-6 days over half of the world's tobacco are flue-cured

2) Sun-Curing - This is suitable only in

dry regions and it's done by exposing the leaves to the sun without any control of relative humidity and temperature.

3) Air-Curing - there, the leaves are hung in of the lowland tropics. It requires a good

well ventilated barns under normal almost zero amount of rainfall and humidity with a temperature

conditions until the sugar content has been

completely oxidized away. It is a very slow process and only $\frac{1}{5}$ th of the world's after topping when the dark green colors of total output is air-dried or air-cured the blade becomes light with a whitening (soft) fire-curing; Read up!

Tickets; Yield of Cured leaves vary from 0.9-3.0 tones per hectare. Yields depend on the edaphic conditions and management skills.

09/08/2018

CASSAVA (*Manihot esculenta*)

It belongs to the family; Euphorbiaceae

Botany - It has just one species (*Manihot esculenta*)

(*Manihot Utilisima* is synonymous to the other)

It is a dicotyledon plant and belongs to the

family of Euphorbiaceae because of its latex

supplied through the flue (metal pipes). Temperature-

Production -

Origin - It is believed to be originated from North

East Brazil some authors have also pointed

as another Central America as possible origin. From these

centres, cassava has spread to various parts of

the globe and it is today cultivated in all

regions of the tropics including Argentina

Climatic & soil requirements - It is a crop

which requires a good

well ventilated barns under normal almost zero amount of rainfall and humidity with a temperature

range of 25-29°C. The crop can tolerate drought and low soil fertility because of its feeder roots which grows vertically into the soil with a depth of 1m. The best soil for cassava is a sandy loamy soil of average fertility and sound drainage.

Cultivars; there are many cultivars of cassava in any area where it is grown. These

cultivars are distinguished on the basis of planting date - Because of the incidence of morphology, leaf shape and size, branch mealy bugs it is important to select healthy ing pattern, growth habit, leaf lobes, stip cuttings free from any contaminants. Improved varieties of cassava like TMS 30573, TMS 30555 are available in National root crops of hydrogen cyanide - Using the hydrogen cyanide, it can be classified into;

- Sweet cassava

- Bitter cassava

The bitter cassava has high cyanide distributed throughout the tuber which stroke under poor growth will produce weak plants due to lowered harvest index.

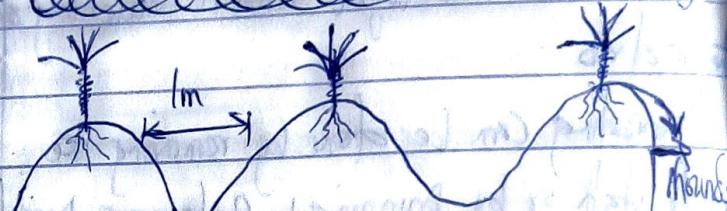
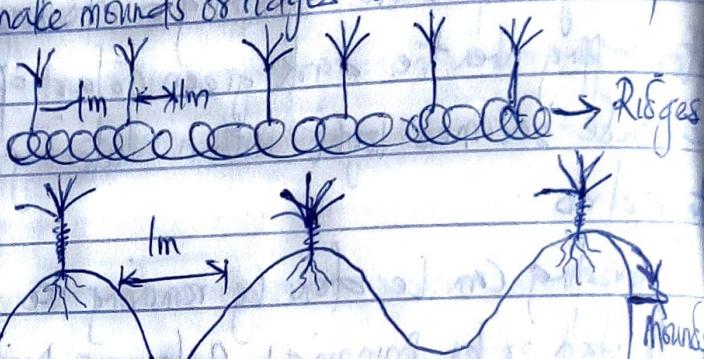
The sweet cassava has a relatively low cyanide.

It is mainly confined to the cassawarly when they are stored in open air, exposed to sun light to reduce storage deterioration, cassava has low cyanide content. Most of long strokes are stored with overhead shade. the cassava varieties in Nigeria are given before planting, it is wise to check the freshness acquisition numbers such as 53 101, 60 of the stick by scratching with the fingernail.

506, 410xx, 30553 etc. If latex exudes from the lesion, it is an indicator. Furthermore, they possess different names that the strokes are still viable & healthy.

Land preparation - clear the area (Well

drained loamy soil) stamp, burn the trash, make mounds or ridges that are 1m apart



desired standards. The plants or stems are cut 25cm long from 10 to 12 months. Shorter

stems under poor growth will produce weak plants due to lowered harvest index.

Cassava stalks dehydrate during storage period, it

direct sunlight to reduce storage deterioration, be

de

per

METHODS OF PLANTING - Planting a single cutting 150 to 200 species which are annuals or
of 25cm long in a slanting position and
a small position containing about 3 nodes
striking out. The practice is the same on the
edge except that the spacing of 1m is
maintained.

Weeding & fertilizer maintenance → Read up

Maturity & Harvest → Read up

Yield of cassava

PROCESSING OF CASSAVA - It is essential so
as to reduce the content of the cyanogenic
glycosides or simply called hydrogen cyanide
and to make the extraction of starch and its
compounds easier. Frying and fermentation
are the readily available method of achieving
these. Cassava can be processed into grain,
starch, flour, flour and livestock feed. Cassava
does not store well. Once harvested, it begins
to deteriorate in the next two or three days if
it is not processed. However, cassava can
be stored in pits for sometime with minimal
deterioration.

Pests & Diseases - Read up

annuals
perennials erect or twining herbs. They are
mostly found in the tropical or warm temperate
regions of the world. There are about 21
cultivated species of beans, amongst these
the most important and most widely cultivated

includes:

- *P. Vulgaris*
- *P. lunatus*
- *P. acutifolius* - *P. guineensis*
- *P. mungo*

The number of species are grown as green
manure and cover crops also fodder. They include:

- *P. acutifolius*
- *P. corylifolia*
- *P. callosa*
- *P. obovata*
- *P. lunatus*
- *P. hypoleuca*
- *P. polystachya*

FIVE IMPORTANT DOMESTICATED SPECIES

P. Vulgaris (Common bean)

P. lunatus (Lima bean)

P. acutifolius (Teffy bean)

P. coccinea (runner bean)

P. Polystachya

P. vulgaris - This is known as common French

BEANS (*Phaseolus*)

The genus '*Phaseolus*' contains about kidney, snap bean. It is the best known and

most widely cultivated species of "Phaseolus". Generally, 300-400mm of grain is required but presently, there are several different cultivars 900-1200mm can be tolerated. The cultural forms of *P. vulgaris*. They differ mainly in habit (erect or bushy) flower colour, size, shape dry weather is required for harvesting of dry and colour of buds and seeds. Generally, shelled beans. They can be grown on most soils the different cultivars are divided into dwarf types from light sands to heavy clays. It requires bush cultivars and it is usually about 120-150mm P greater than 3-2 common beans or bush cultivars. They do not require support and grow within a temperature range between 17.5-27°C. Other temperatures above 30°C may they mature early.

Secondly, the climbing or trailing or vine cultivars are about 2-3cm tall. They require support and they take longer to mature and have longer bearing season.

Common bean is grown for its green leaves,

The crop is propagated from seeds, in Northern green pods and immature and/or dry seeds. In Nigeria, they are often grown in rows at the spacing of 45 by 60cm but there may be differences in plant. They are appreciated in the different spacing depending on local situations. Wool because of their long storage life, however, it should not be less than 15 by 15cm. In Subsistence Cultivation in Africa, no preparation.

Environmental factors: The common bean is not suited to the wet tropics but does well in the areas of medium rainfall, from the pods to bulge -

causes flower drops and increases the incidence of diseases.

cause the flower buds to fall as a result of wilting due to moisture stress and above 35°C, seeds may not form - common bean is also sensitive to salt. (Salinity).

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The crop is seldom manured, they are harvested before the pods are fully grown and while the seeds are still small and do not cause the pods to bulge -

Harvesting: picking of the beans 2-4 weeks after the first flower and 7-8 weeks after sowing in early cultivars - They should be picked every

red but 3-4 days - Dry beans are harvested as soon as flower as the large percentage of the pods are fully and white matured and has turned yellow. Generally, beans of dry mature in 80-110 or 120 days.

Major diseases of beans

- If req-
beans
1) Anthracnose - *Cercospora lindemuthianum*
2) Fusarium root → *Fusarium oxysporum*-
(7.5-3)
3) Rust - *Uromyces phaseoli*.
may 4) Mosaic (virus) -

Pests

- 5°, 1) Aphids & leaf hoppers.
6 Sen-2) Beetles (*Callosobruchus spp*)
3) Bean Weevils.

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