

MRS

E. G.

MORUA

daughter

CHIRWA

09251

fibrous

monocotyledon

epidermis

secondary

INTERNATIONAL

CERTIFICATE

AGRICULTURAL

PRACTICAL

DIAGRAMS

BY

WITS NG'OMBA

CALL +2658529886

2008

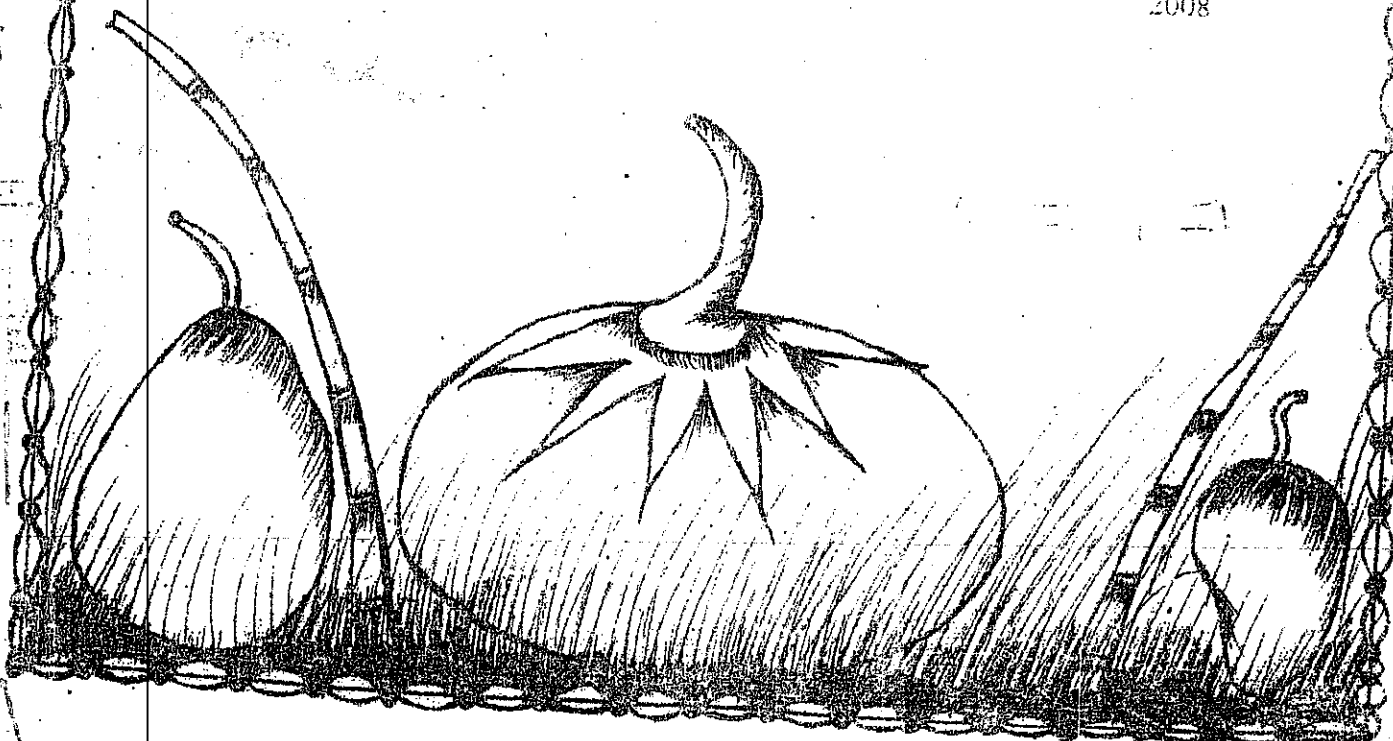


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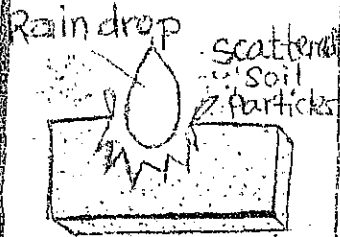
TOPIC

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PARTS AND FUNCTIONS: BEANS, TOMATO, ROOTS
(FROM PAGE 21 ONWARDS)

THE FOUR TYPES OF SOIL EROSION

SPLASH



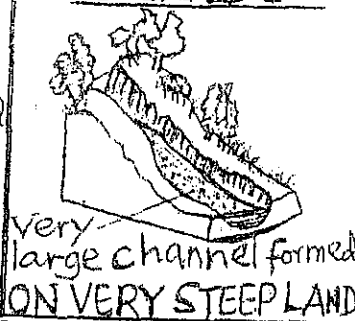
ON BARE LAND

RILL



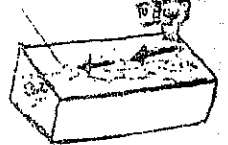
ON GENTLE SLOPE

GULLY

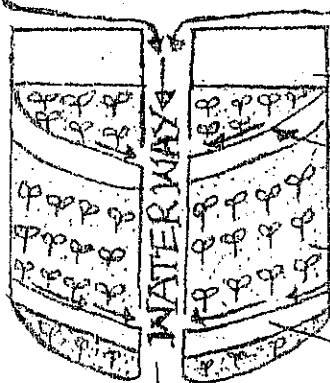


SHEET

Thin layer of top soil is removed



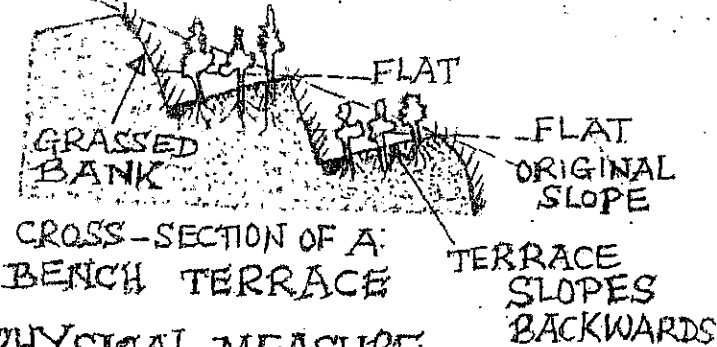
ON FLAT LAND



STORM DRAIN: Divert run-off water to water way.
GRADED BUND: Divert run-off water safely off the farm land to a water way.

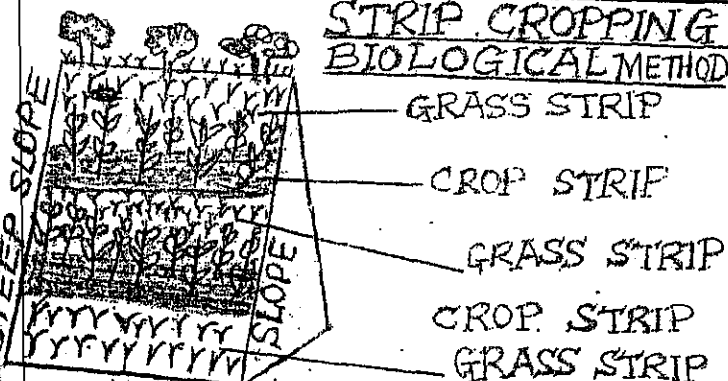
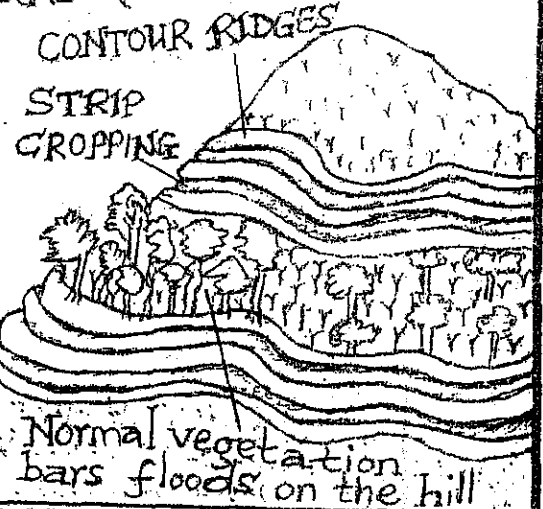
PHYSICAL MEASURES TO CONTROL SOIL EROSION (OTHERS): Box-ridging, Dams

WATER WAY: carry water off a catchment area safely into a lake (water body).



PHYSICAL MEASURE

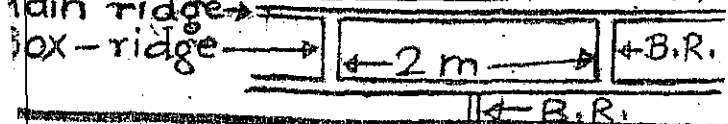
Terraces reduce run-off speed (increase infiltration)



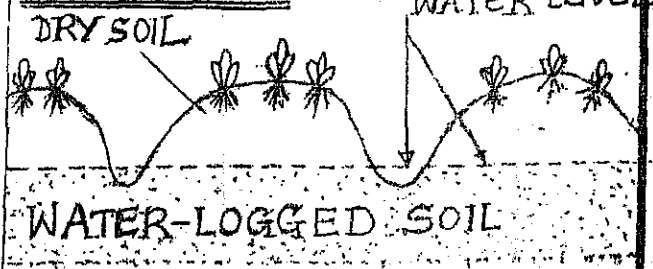
STRIP CROPPING BIOLOGICAL METHOD

GRASS STRIPS REDUCE RUN-OFF SPEED * LOW EROSION IN CROP STRIPS

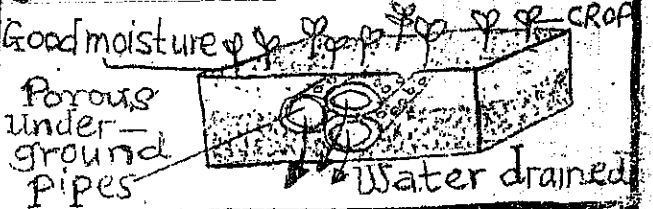
BOX OR TIE-RIDGES (B.R./T.R.)



1. SURFACE DRAINAGE METHODS



2. SUB-SURFACE DRAINAGE

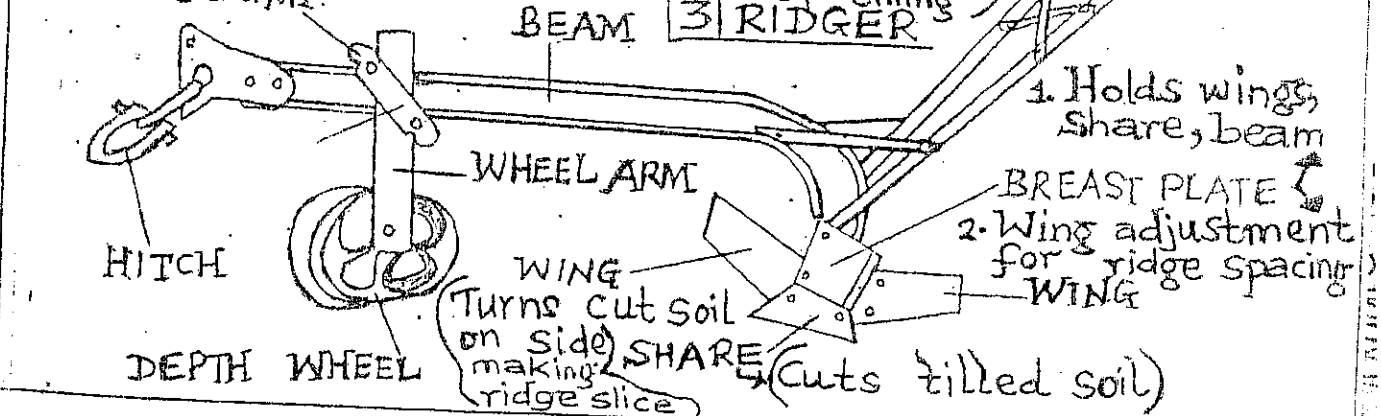
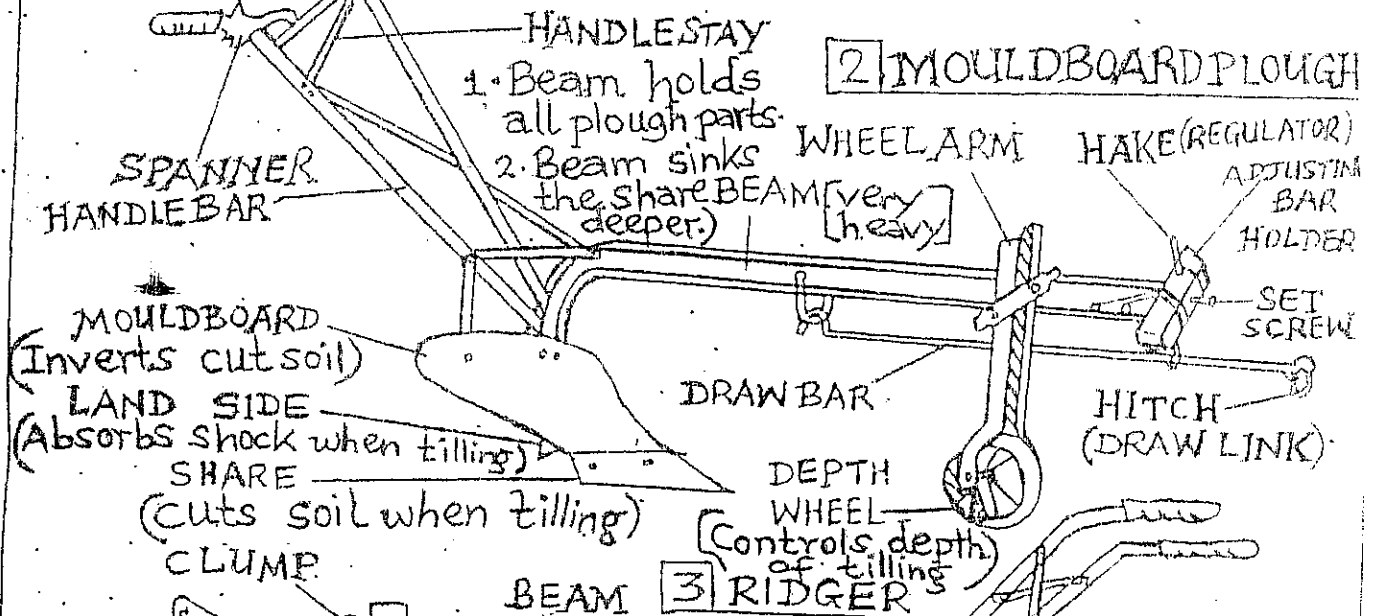
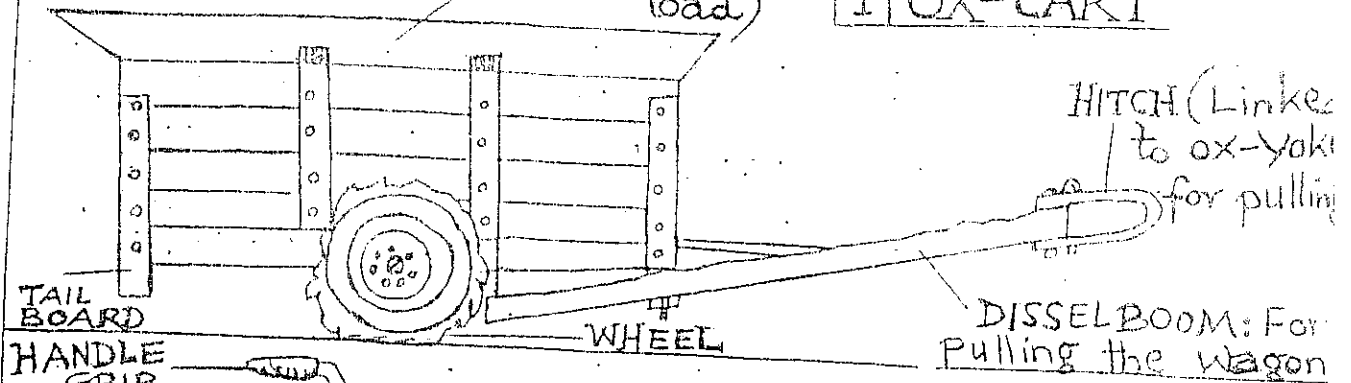


FARM MACHINES OR IMPLEMENTS OR EQUIPMENT

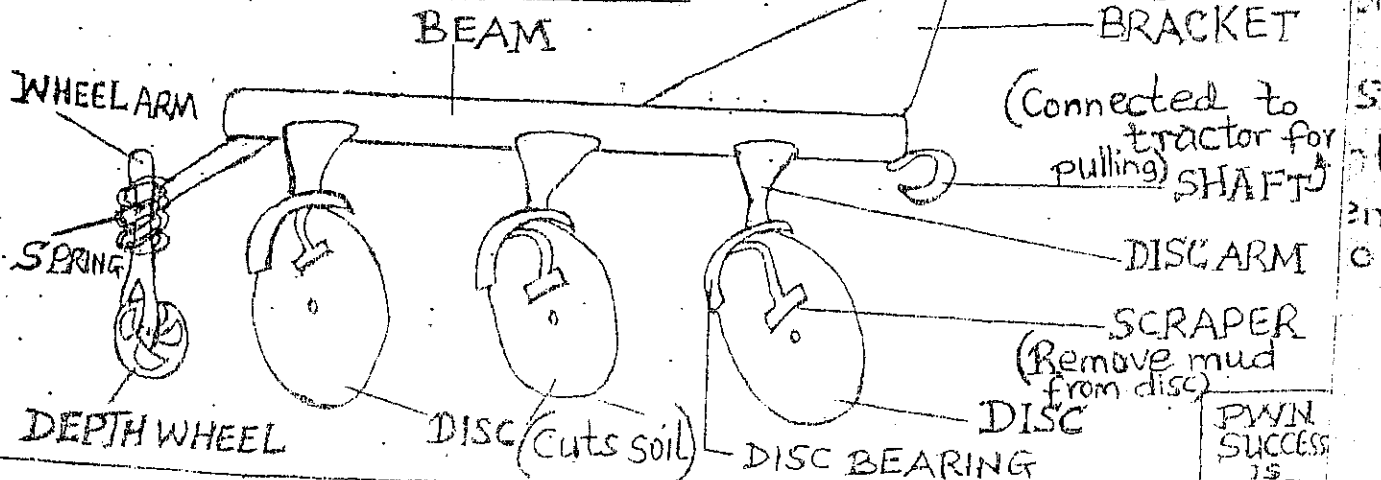
AGRICULTURE

BODY (carry the load)

1 OX-CART

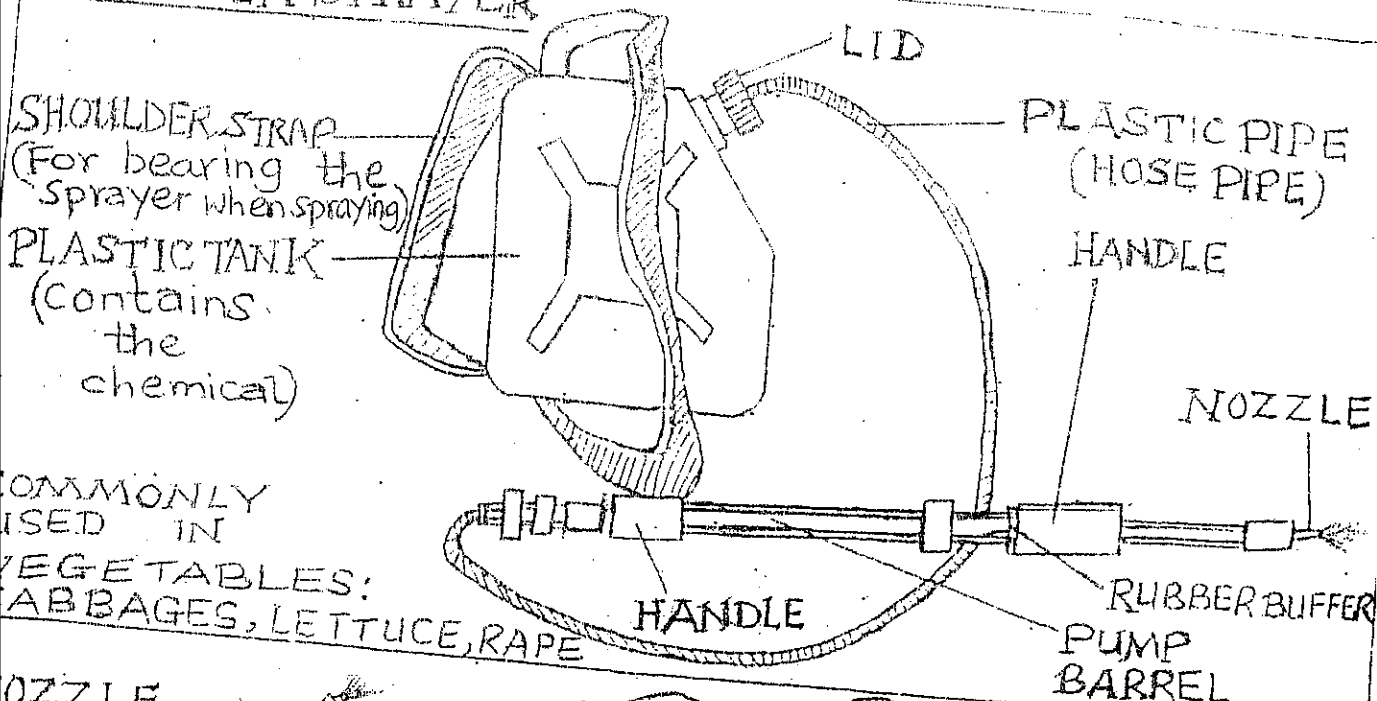


4 DISC PLOUGH

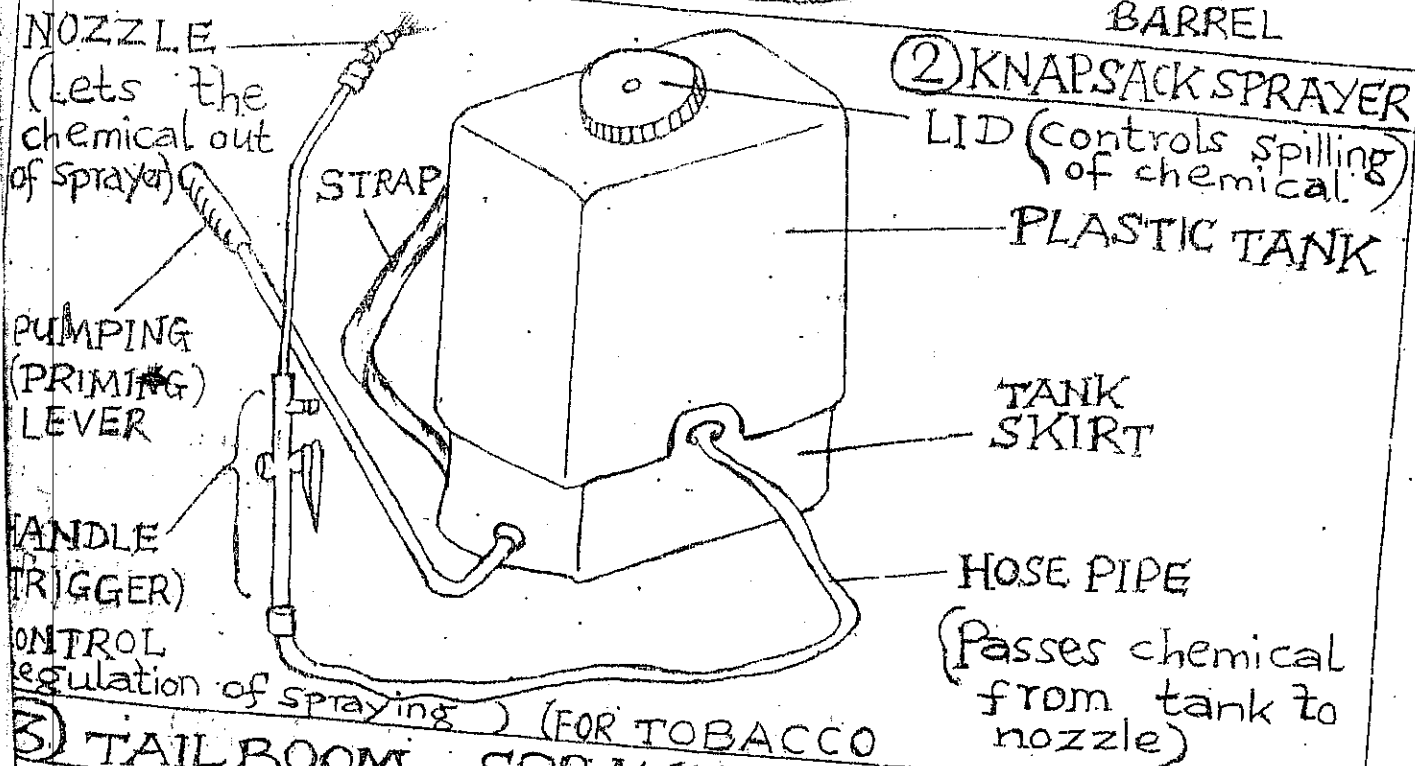


PRODUCTION

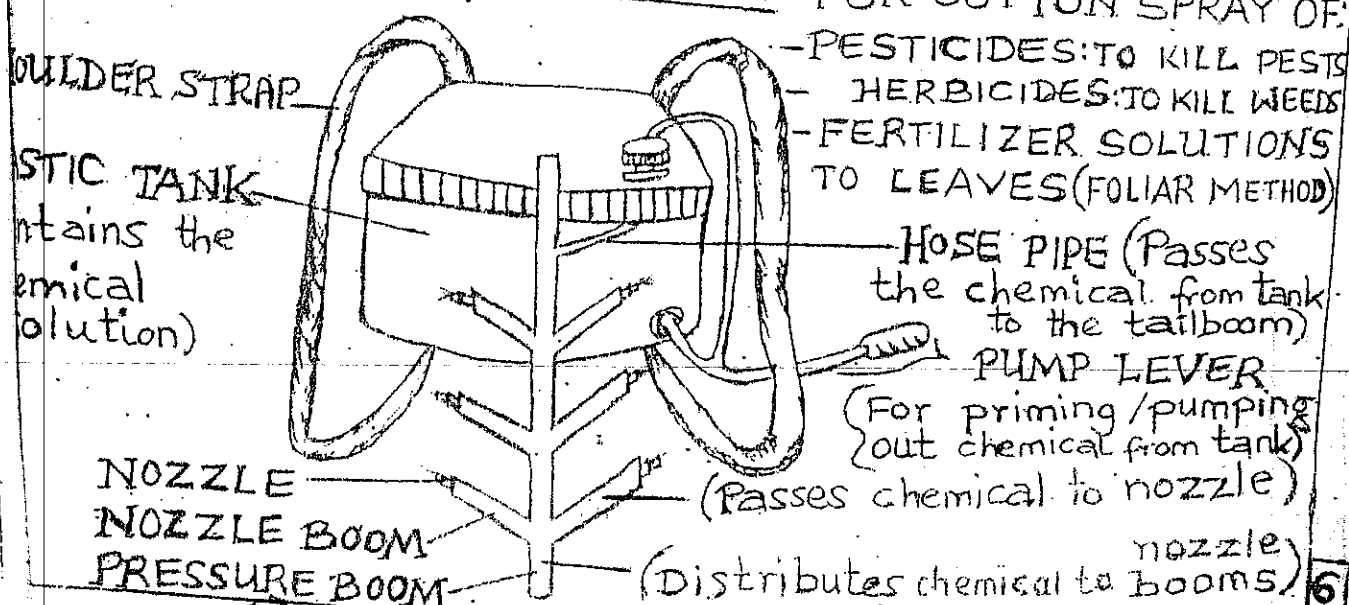
① GARDEN SPRAYER

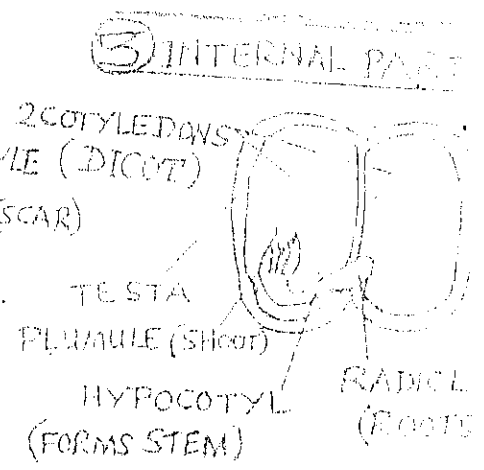
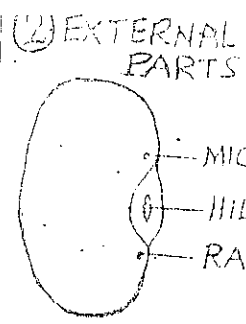
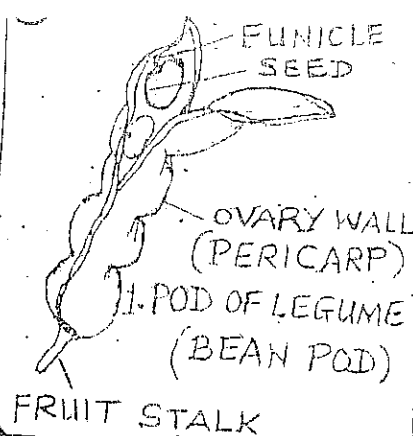


② KNAPSACK SPRAYER



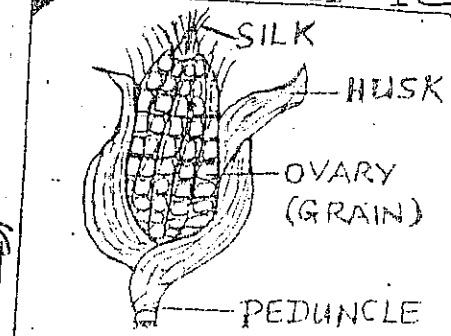
③ TAILBOOM SPRAYER



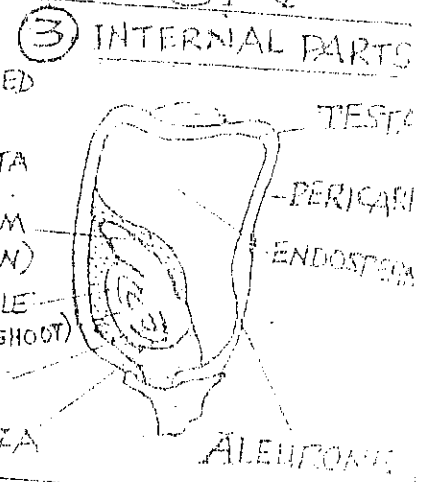
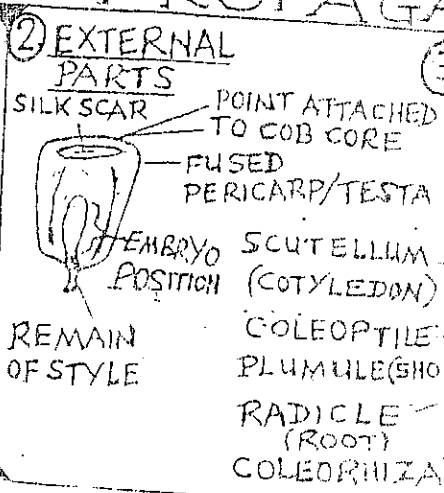


BEAN SEEDS
LEGUME
- DICOT -

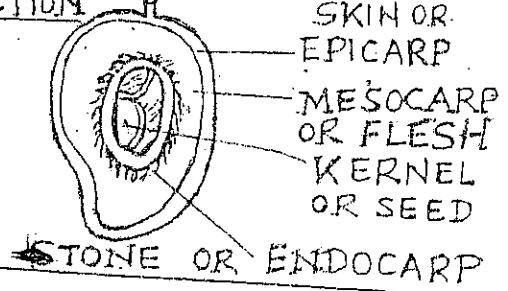
SEXUAL PROPAGATION



① MAIZE COB

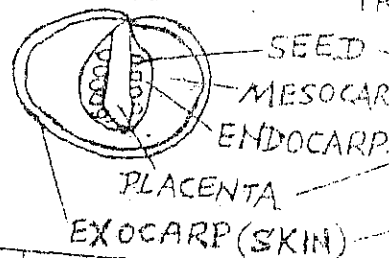


MANGO FRUIT
LONGITUDINAL SECTION



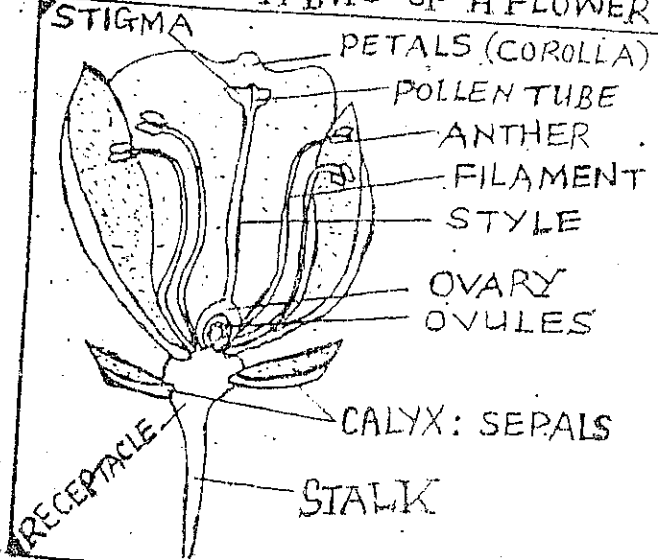
INTERNAL PARTS

LONGITUDINAL SECTION



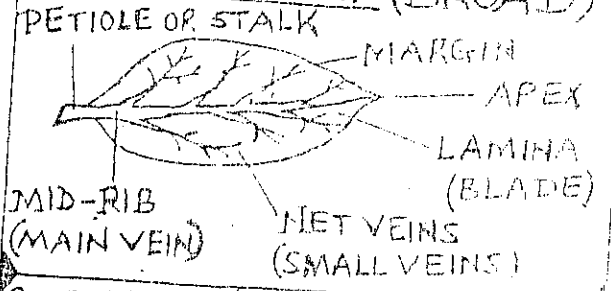
TOMATO FRUIT
LONGITUDINAL SECTION
CROSS-SECTIONAL TRANSVERSE SECTION

INTERNAL PARTS OF A FLOWER

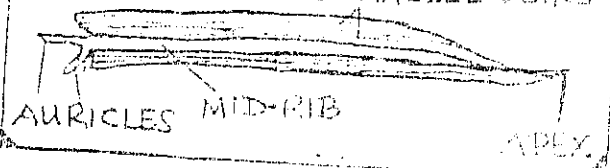


LEAF SHAPES

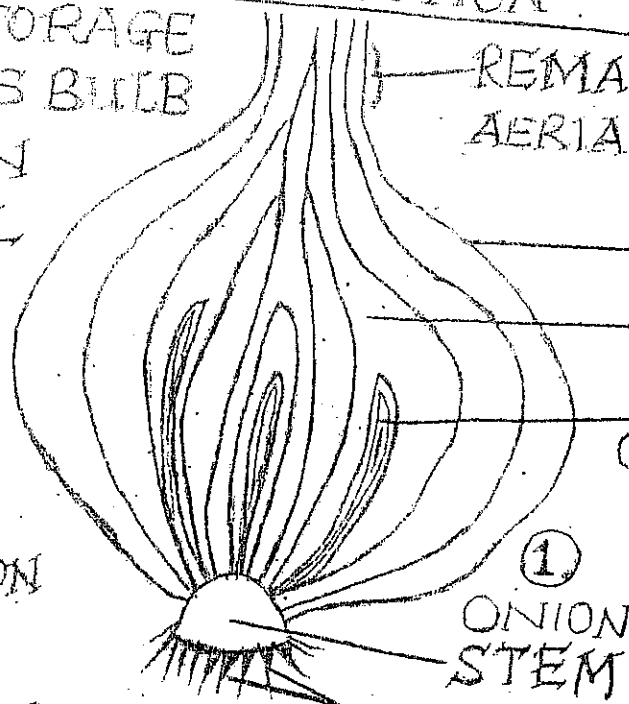
1. LEGUME LEAF (BROAD)



2. CEREAL (GRASS) LEAF (NARROW)



FOOD STORAGE ORGAN IS BULB OF ONION
INTERNAL & EXTERNAL PARTS



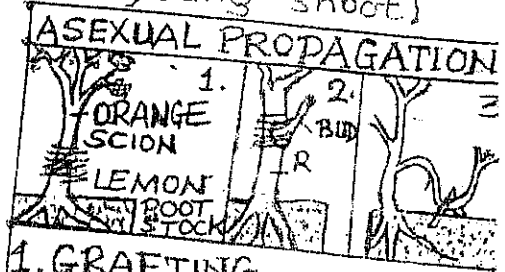
REMAIN OF PREVIOUS AERIAL GROWTH

SCALE LEAVES (Protect inner parts)

FLESHY LEAVES (store food)

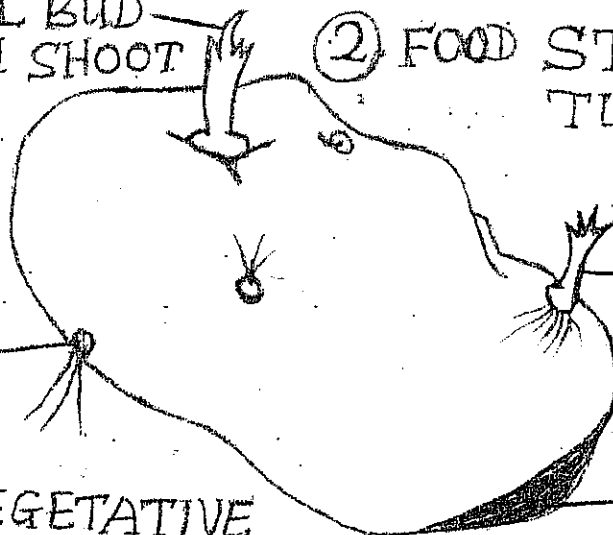
LATERAL BUD (Form young shoot)

ASEXUAL PROPAGATION



1. GRAFTING
2. BUDDING
3. LAYERING

TERMINAL BUD FORMING NEW SHOOT



② FOOD STORAGE ORGAN TUBER - POTATO (EUROPEAN POTATO)

YOUNG SHOOT

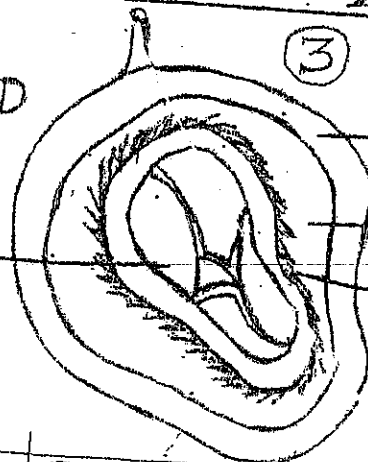
AXILLARY BUD

SEXUAL/VEGETATIVE PROPAGATION

SCAR OF ATTACHMENT TO PARENT PLANT

INTERNAL PARTS OF A MANGO FRUIT

SEXUALLY PROPAGATED



EPICARP (SKIN)

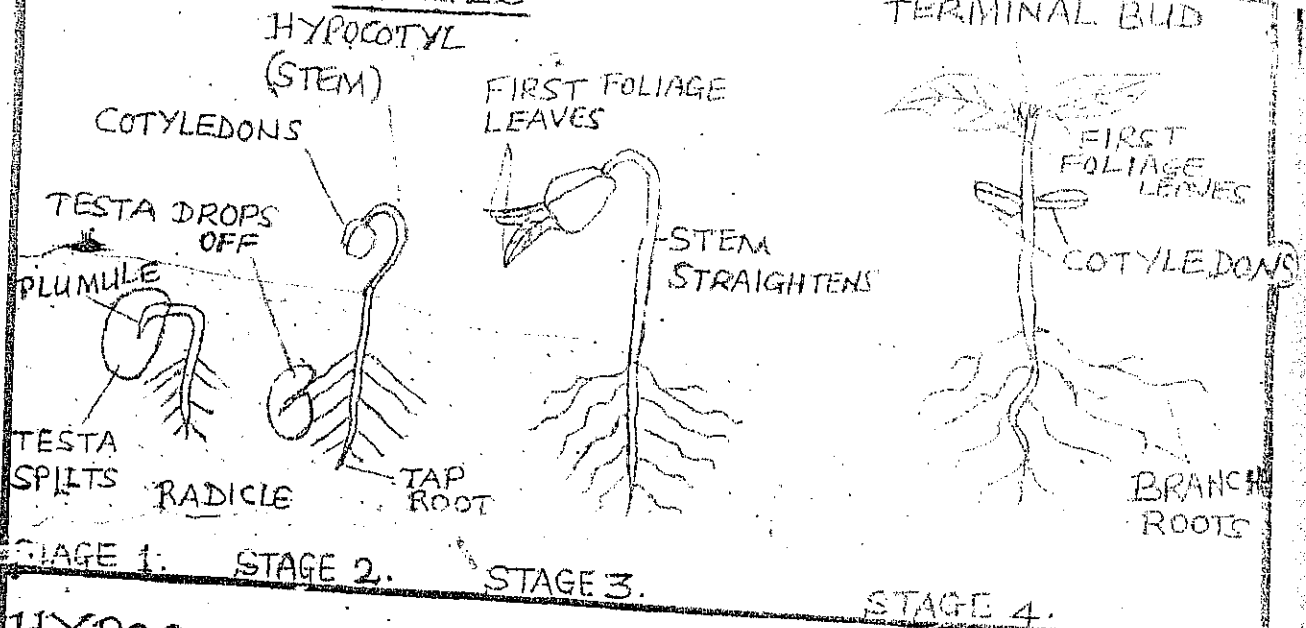
MESOCARP (FLESH)

ENDOCARP (STONE) (STONE)

SEED

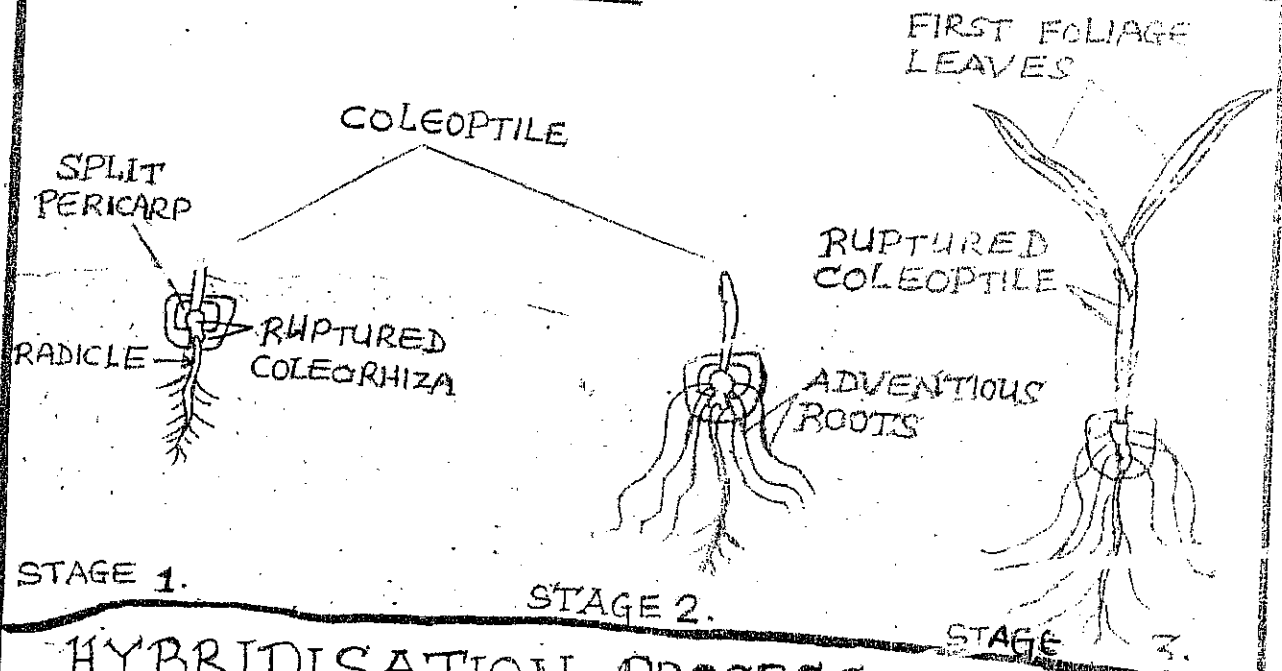
EPIGEAL GERMINATION IN BEAN

STAGES

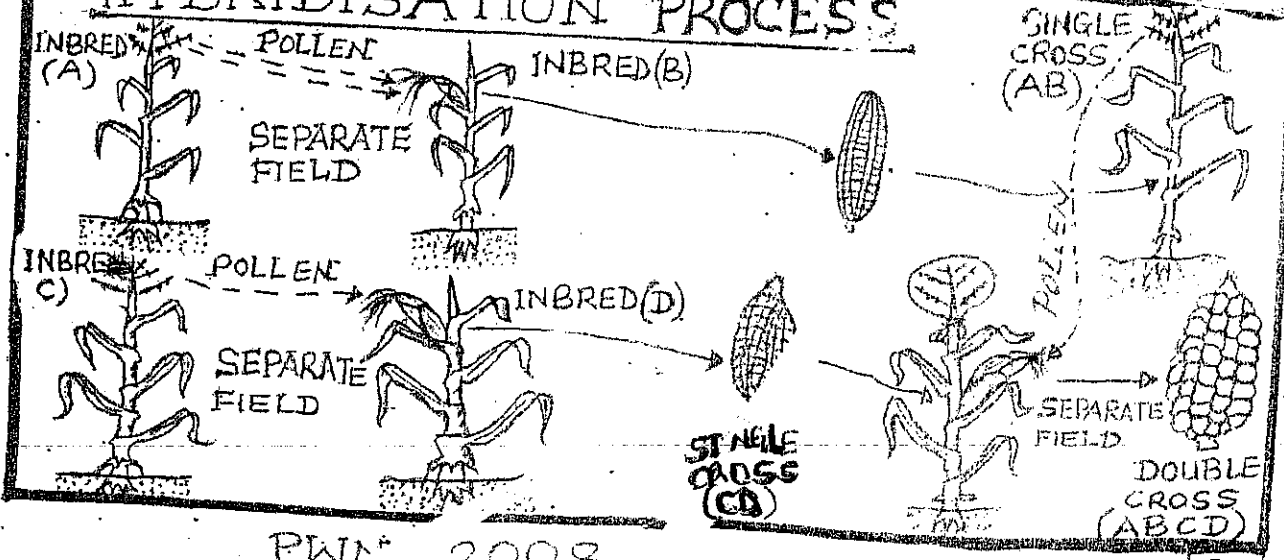


HYPOGEAL GERMINATION IN MAIZE

STAGES

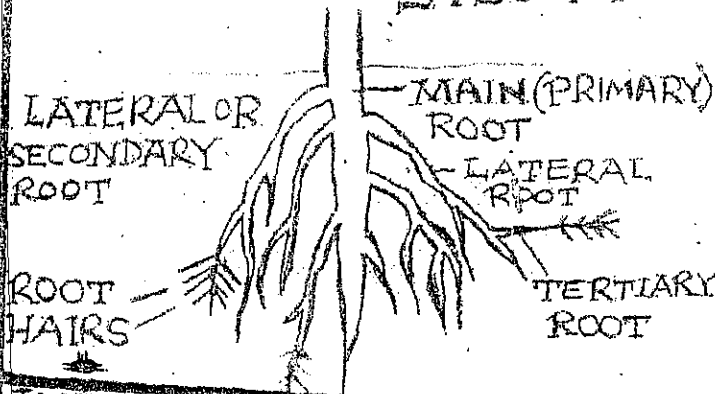


HYBRIDISATION PROCESS

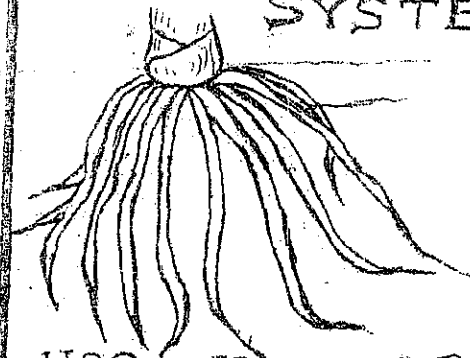


AGRO-DIAGRAMS

A TAP ROOT SYSTEM

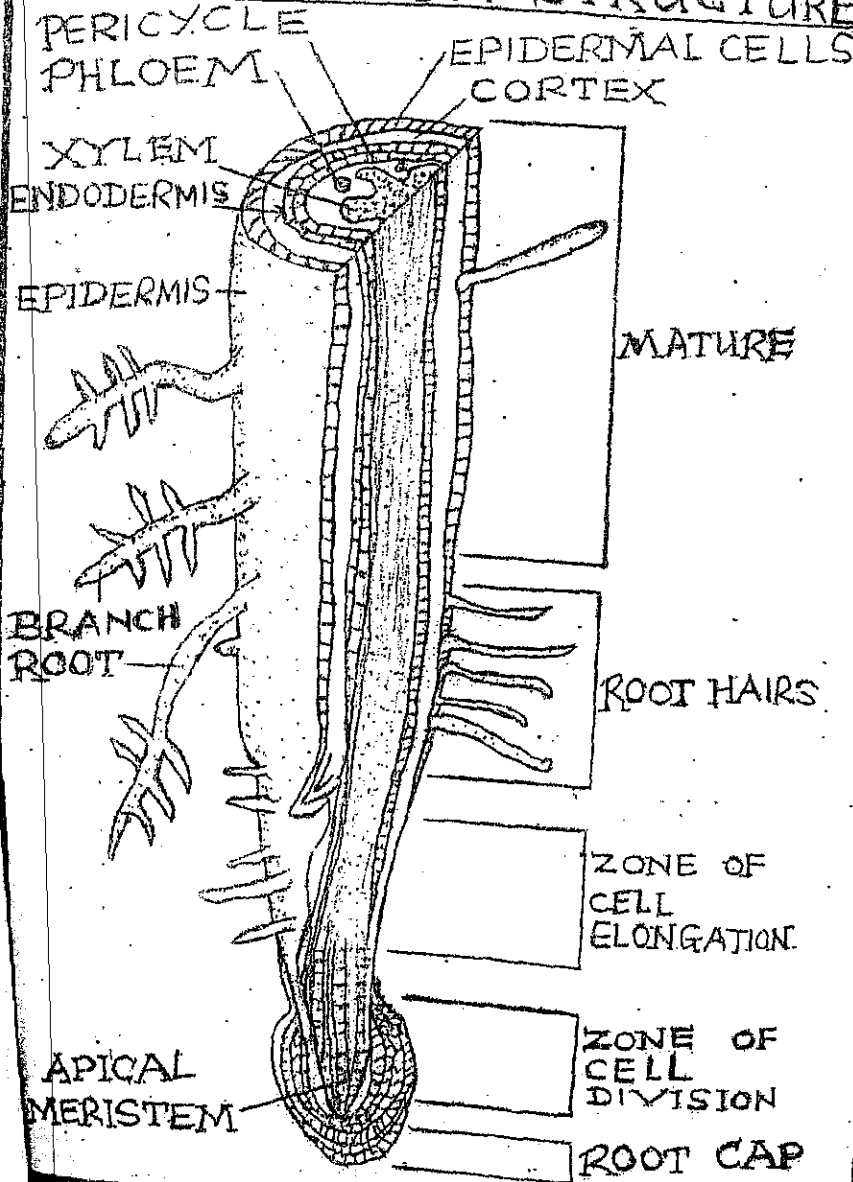


FIBROUS ROOT SYSTEM

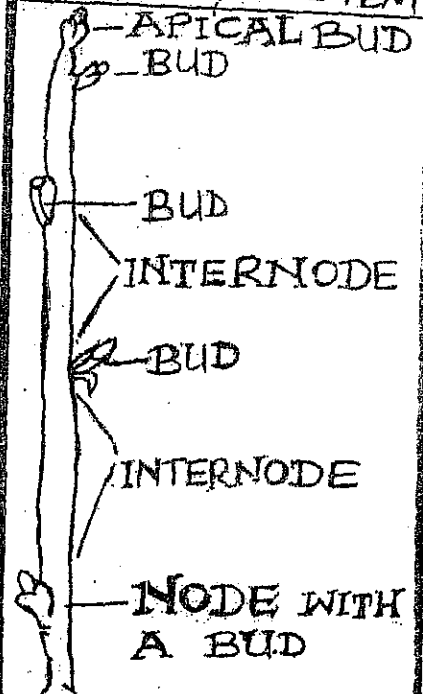


-HAS NO MAIN ROOT
-ALL ROOTS ALMOST SAME

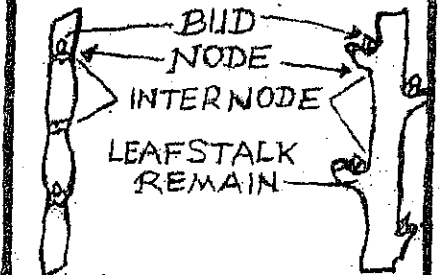
INTERNAL ROOT STRUCTURE



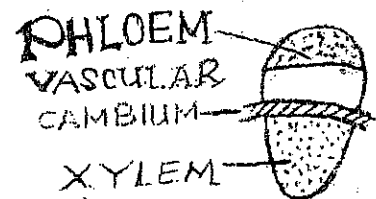
EXTERNAL PARTS OF LEGUME STEM



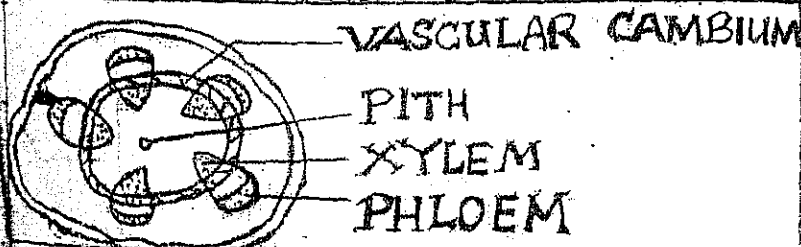
STEM CUTTINGS OR SETTS



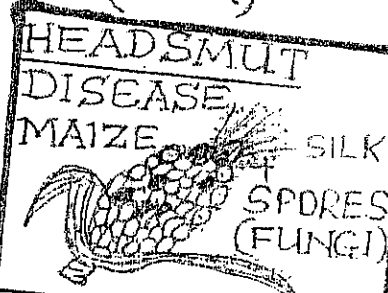
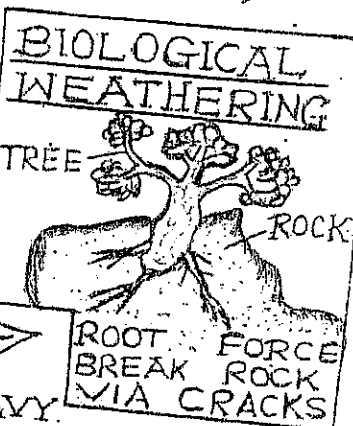
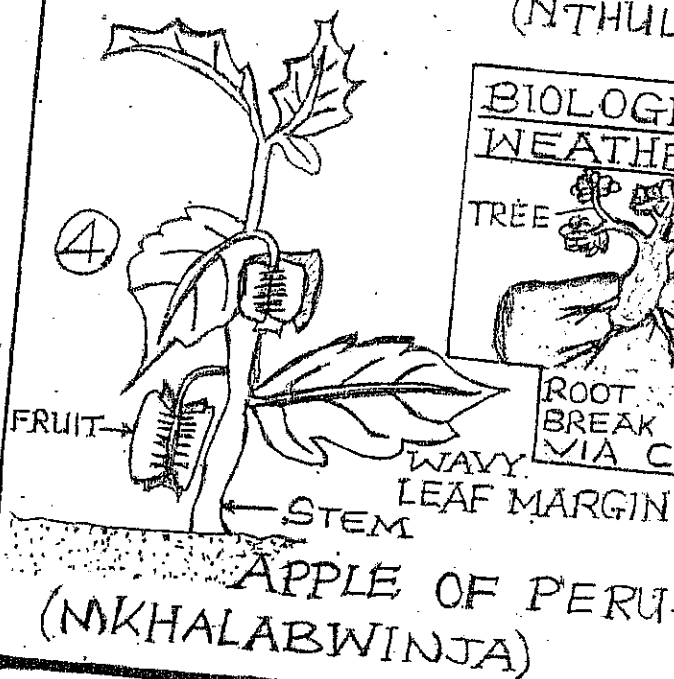
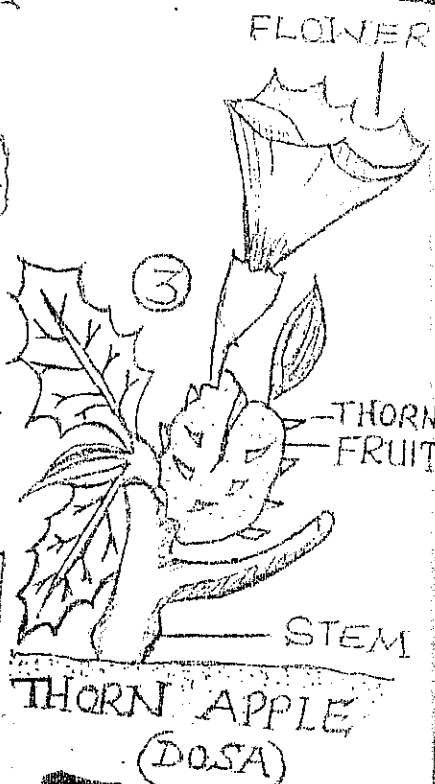
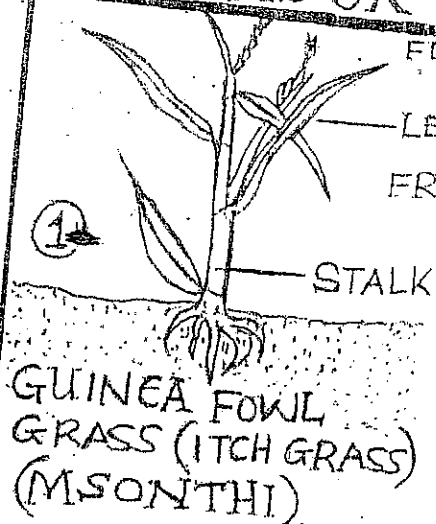
SUGARCANE CASSAVA VASCULAR BUNDLE



CROSS-SECTION OF STEM



4 MAJOR WEEDS IN PASTURE



APPLYING FERTILIZER USING THE DOLLOP OR SIDE DRESSING METHOD

A = B = 7 TO 10 CM

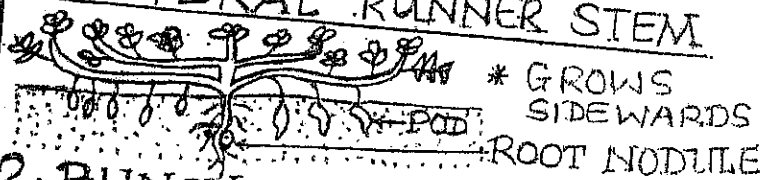


LEAF SPOT ON G/NUT LEAVES

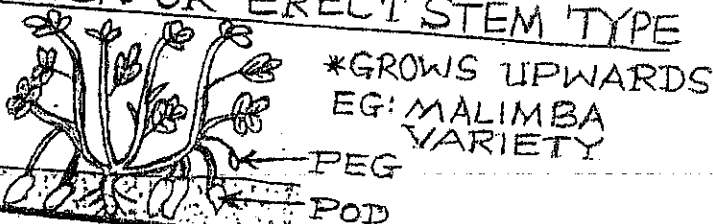


TWO GROWTH HABITS OF GROUNDNUT STEMS

1. LATERAL RUNNER STEM

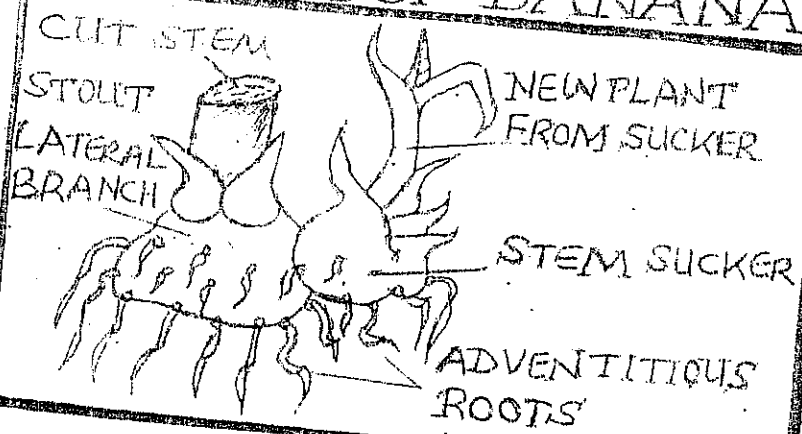


2. BUNCH OR ERECT STEM TYPE

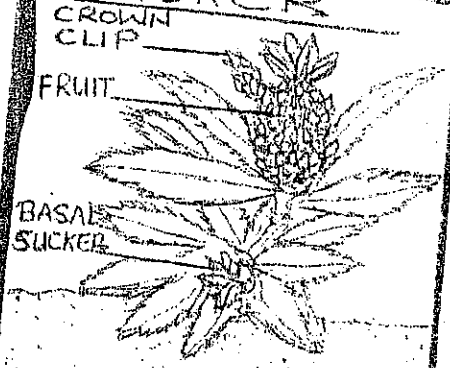


AGRICULTURE MADE SIMPLE

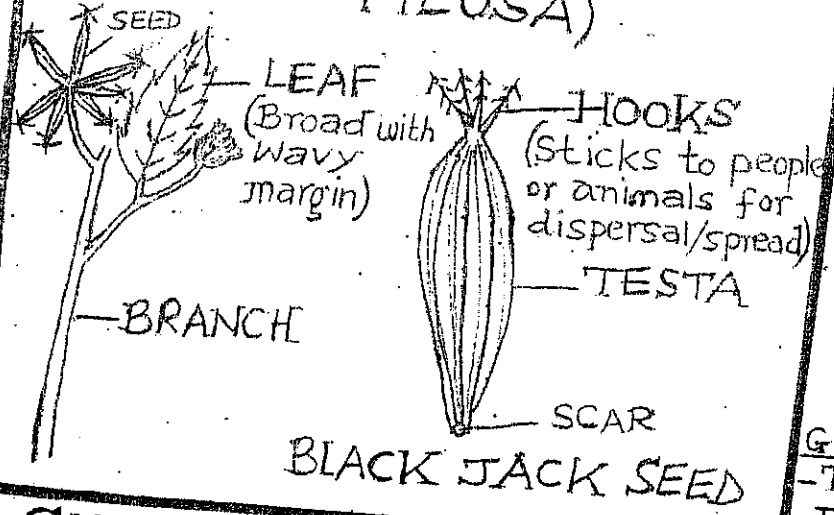
SUCKER OF BANANA



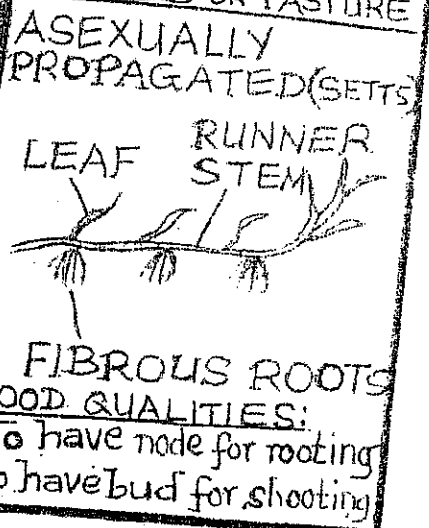
PINE-APPLE SUCKER



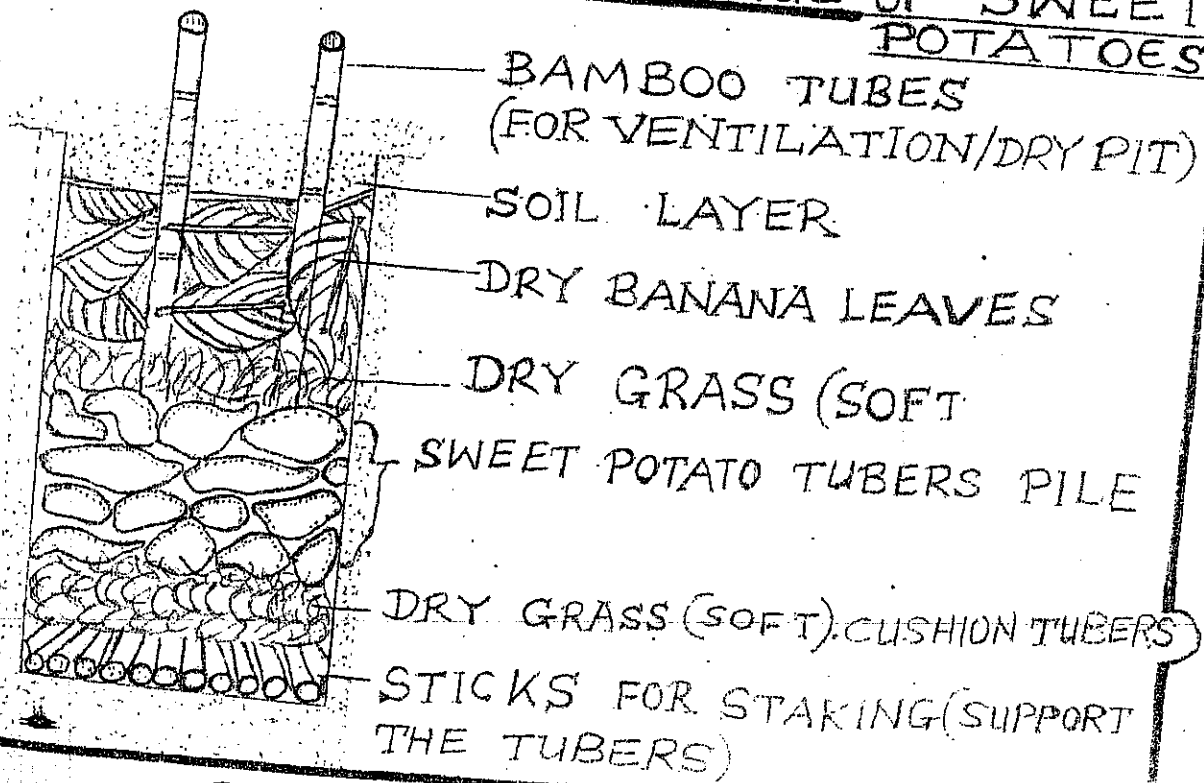
BLACK JACK WEED (BIDENS PILOSA)



STAR GRASS WEED OR PASTURE



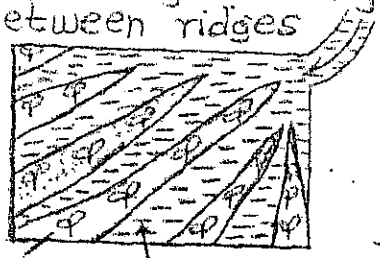
SILO (PIT) FOR STORAGE OF SWEET POTATOES



2008 AGRICULTURE MADE SIMPLE

EXAMPLES OF SURFACE IRRIGATION(ABC)

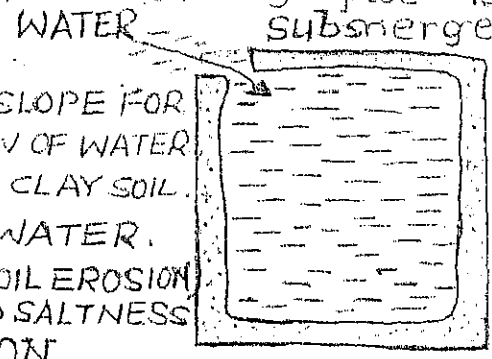
1. A. FURROW IRRIGATION
 Water flows in furrows
 between ridges



CROP RIDGE FURROW

- REQUIRE:
- GENTLE SLOPE FOR FREE FLOW OF WATER
 - HEAVY OR CLAY SOIL
 - A LOT OF WATER.
 - * CAUSES: SOIL EROSION, SILTING AND SALTNESS

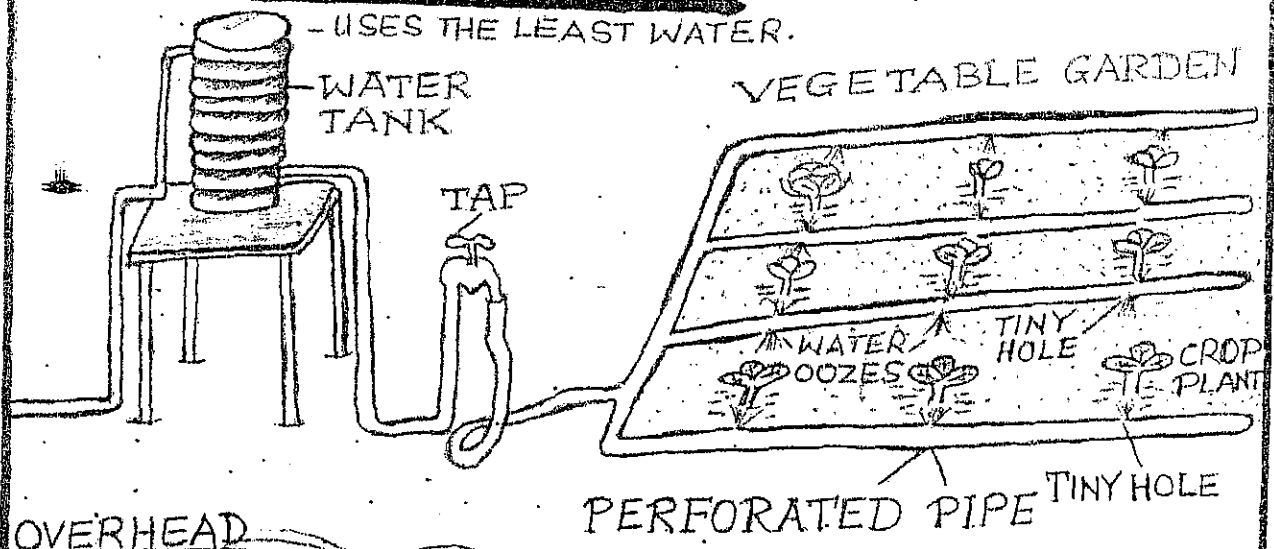
1B. FLOODING
 A large plot is submerged



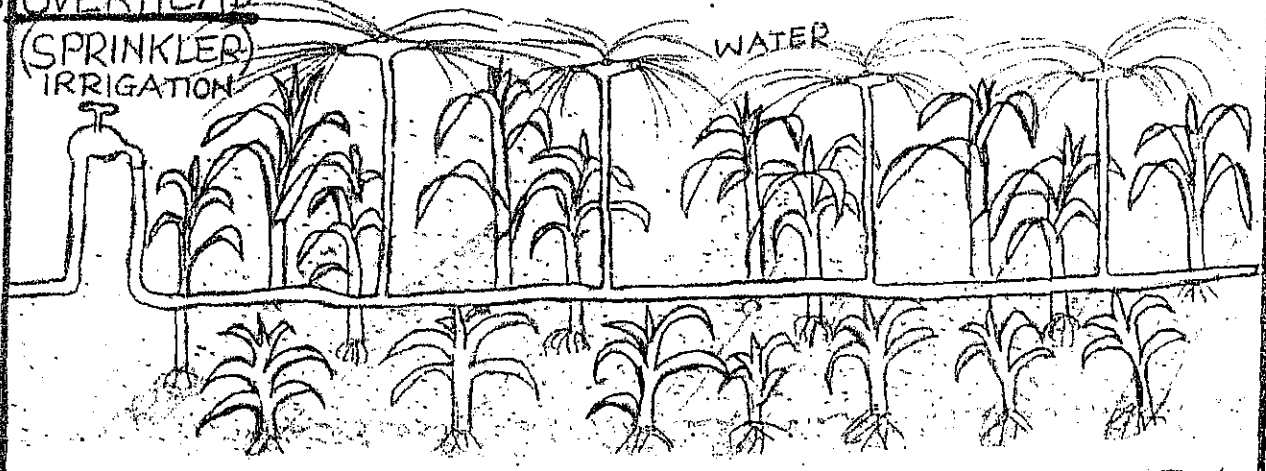
RICE PLOT

2. DRIP OR TRICKLE IRRIGATION

- USES THE LEAST WATER.

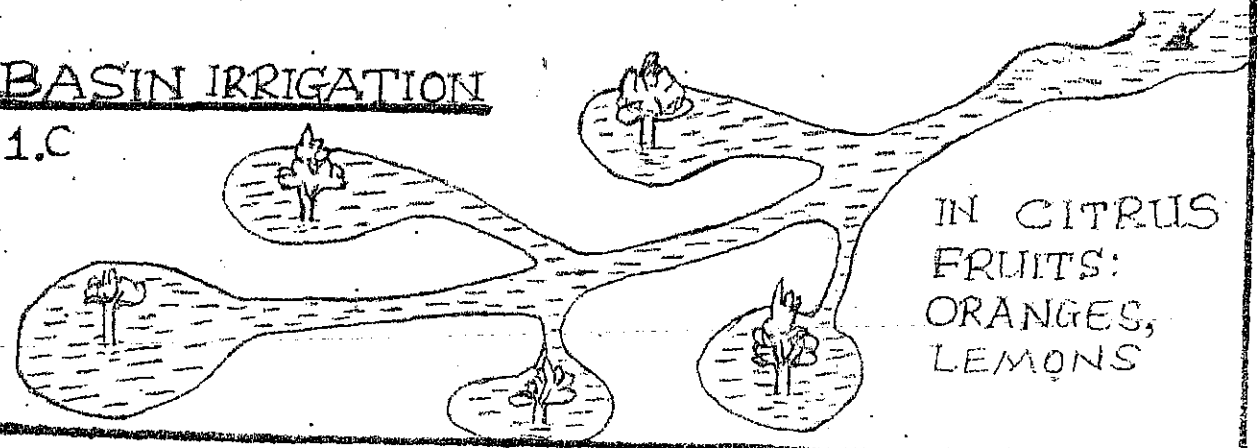


3. OVERHEAD (SPRINKLER) IRRIGATION



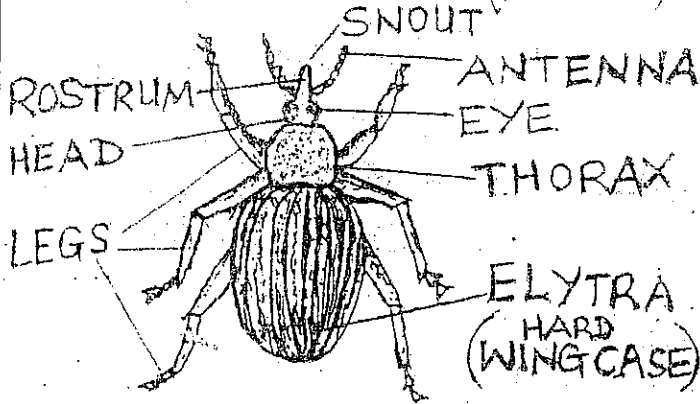
BASIN IRRIGATION

1.C



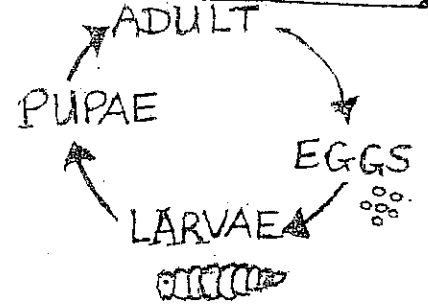
CROP PESTS AND THEIR LIFE-CYCLES

MAIZE WEEVIL (ADULT)



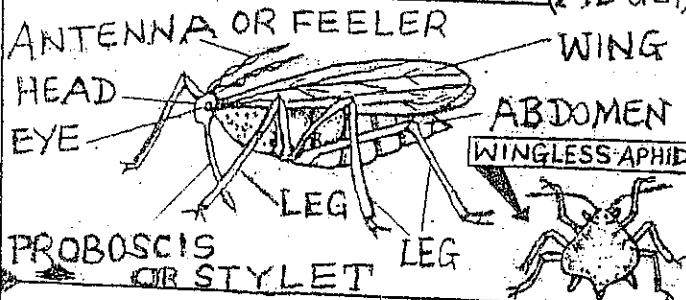
BOTH A STORAGE AND FIELD PEST

WEEVIL LIFE-CYCLE



*HAS BORING (DRILLING) MOUTH PARTS
*BREED/MULTIPLY IN HOT AND HUMID CONDITIONS

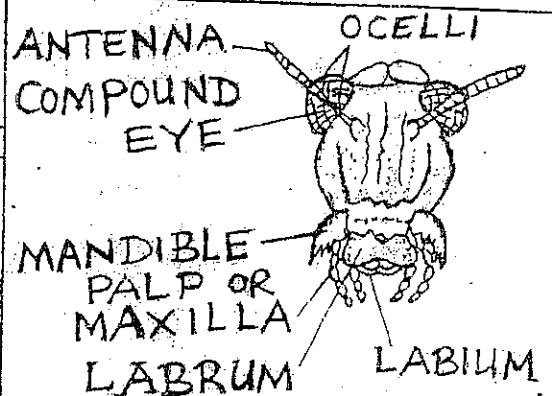
GROUND NUT APHID (ADULT)



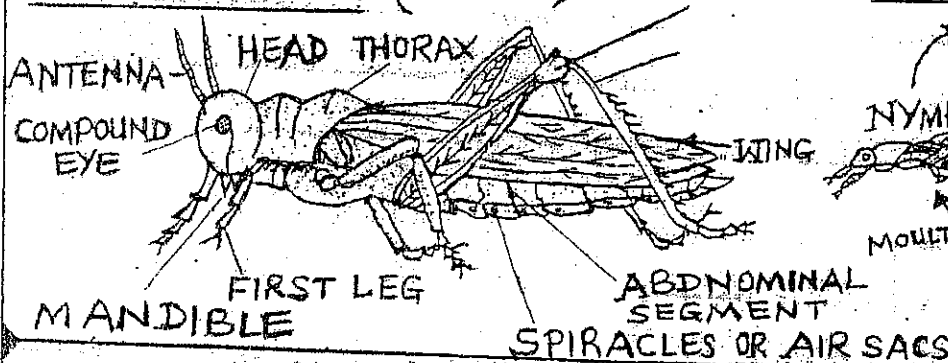
NEMATODE OR EELWORM



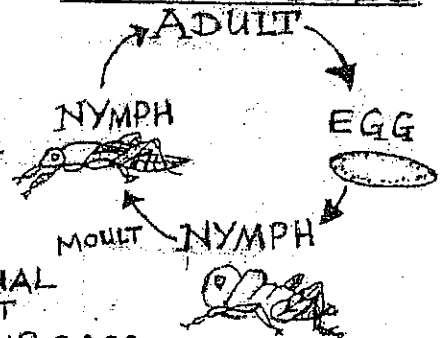
LOCUST FRONT-VIEW



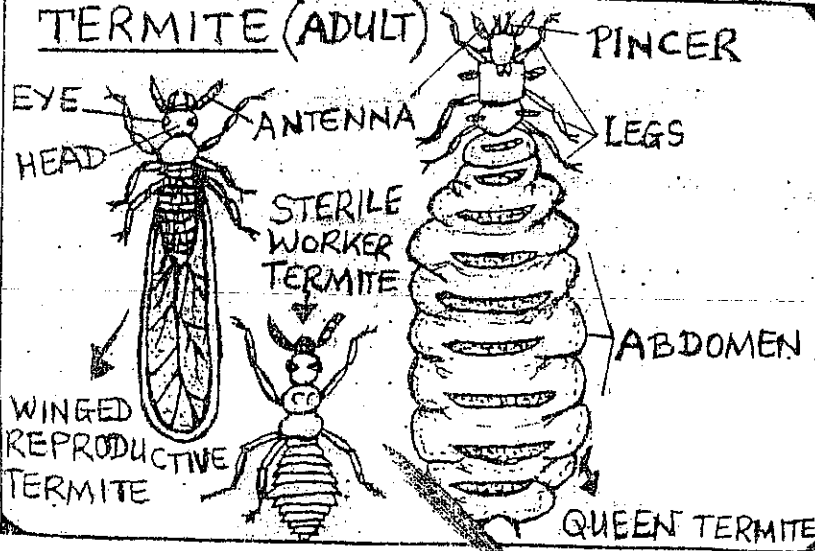
GRASSHOPPER (ADULT)



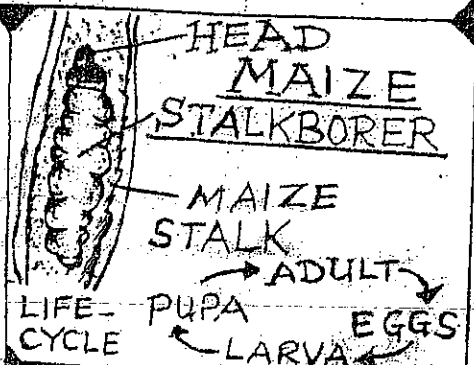
LIFE CYCLE



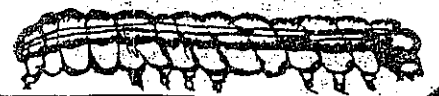
TERMITE (ADULT)

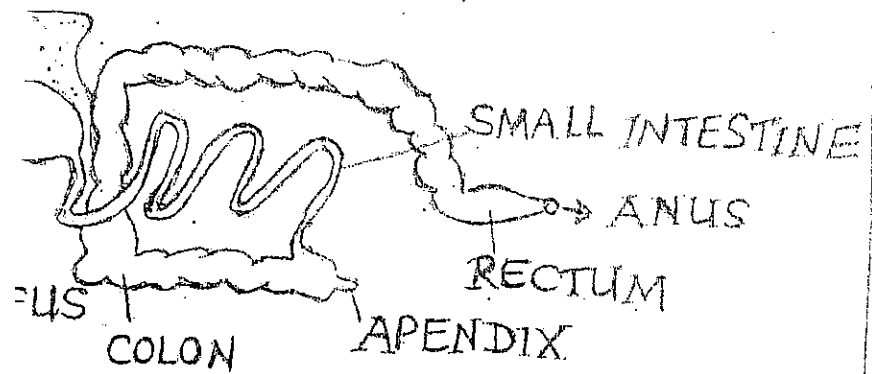


MAIZE STALKBORER

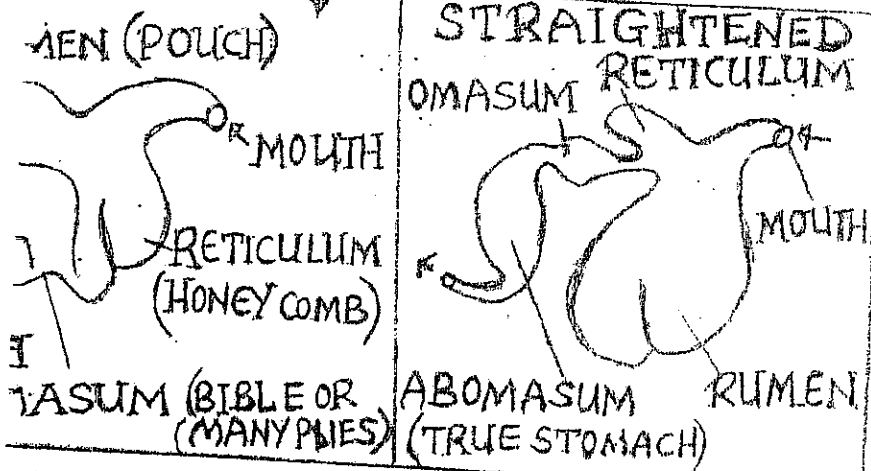


CATERPILLAR OR ARMYWORM



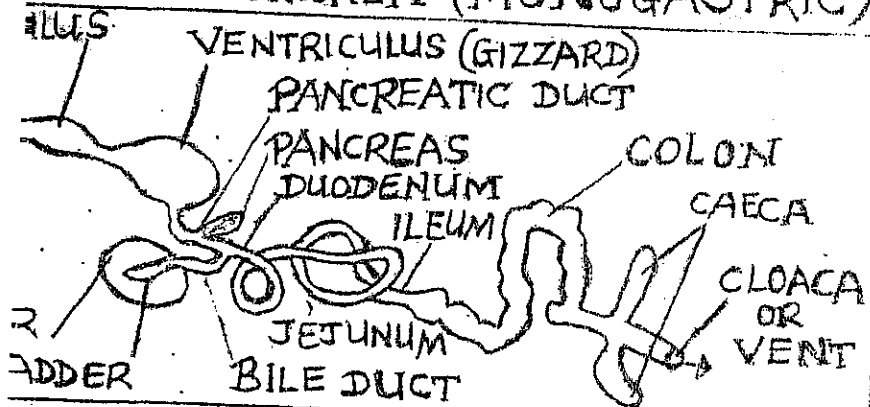


MONOGASTRIC DIGESTIVE SYSTEMS (STOMACHS) IN POLYGASTRICS

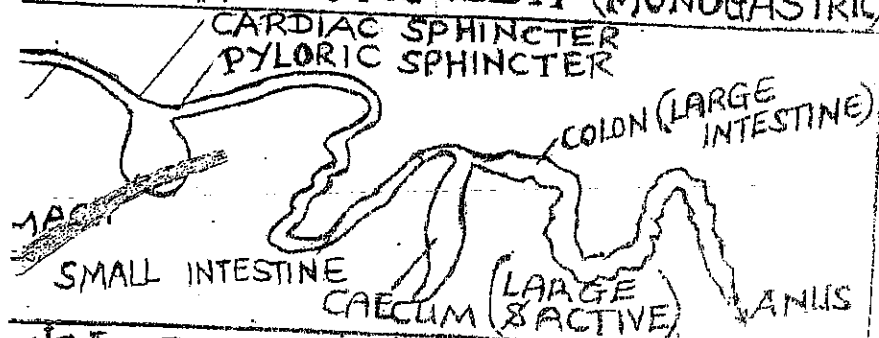


EXAMPLES: Cattle, Goat, Sheep

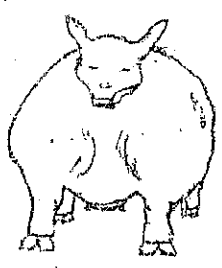

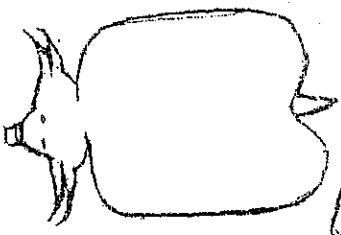

DIGESTIVE SYSTEM OF CHICKEN (MONOGASTRIC)




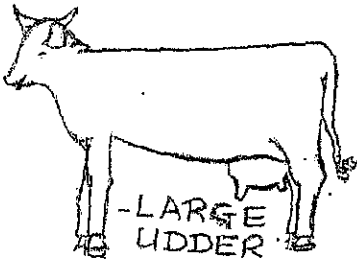
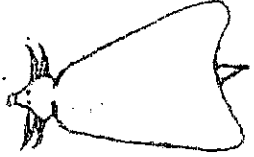

DIGESTIVE SYSTEM OF A RABBIT (MONOGASTRIC)

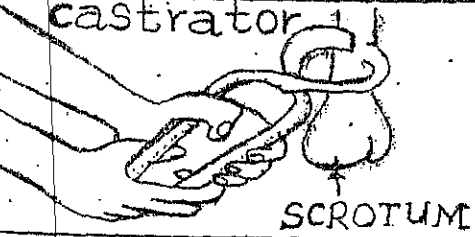
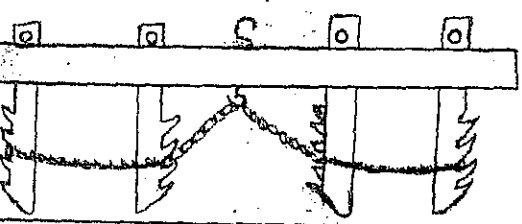



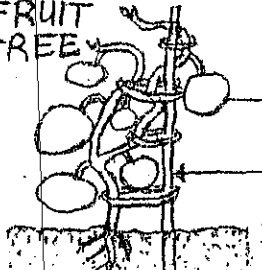
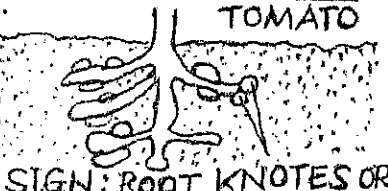
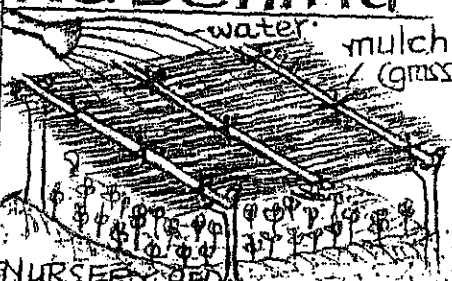
VIEWING BEEF (MEAT) CATTLE (COW)

FRONT VIEW	SIDE VIEW	AERIAL/TOP	RESTING POSITION
			
- MUSCULAR OR FAT	- SMALL UDDER - SHORT LEGS	SHAPE: Rectangular or SQUARE	

VIEWING DAIRY (MILK) COW/CATTLE

FRONT	SIDE VIEW	AERIAL VIEW	RESTING POSITION
			
- IS LEAN	- LARGE UDDER - LONG FRONT LEGS	SHAPE: TRIANGULAR OR WEDGE	

BURDIZZO	OX-YOKE	BEETLE
 <p>castrator</p> <p>SCROTUM</p>		 <p>G/NUT PEST</p> <p>- Eat roots - Eat seed in storage</p>

STAKING/SUPPORTING FRUIT TREE	NEMATODE OR ATTACK IN TOBACCO TOMATO	MULCHING
 <p>TOMATO FRUIT</p> <p>DRY STICK OR BAMBOO</p>	 <p>SIGN: ROOT KNOTS OR SWOLLEN ROOTS</p>	 <p>water</p> <p>mulch (grass)</p> <p>NURSERY BED</p>

QUESTIONS

- State any four physical distinctions between the beef and dairy cattle above.
- Why are the following important
 - Burdizzo? (c) mulching - five points (f) Dehorning
 - Ox - yoke? (d) Staking? (e) Castration (g) D

FOR PAGE NUMBER SEVEN
PART FUNCTIONS

(A) IN BEANS

- a. OVARY WALL - Protects bean seeds from physical injury and Pathogens.
- b. FUNNICLE - Attaches seed to inside wall of the pod.
- c. MICROPYLE - Allows oxygen in for respiration.
- Allows water in for dissolution of stored food at Germination.
- d. HILUM - Point attached to funnicle
- e. TESTA - As in ovary wall above
- f. COOTYLEDONS - Stores food (proteins) for the embryo growth
- g. RADICLE - Develops into roots system.
- h. HYPOCOTYL - Develops into stem
- i. PLUMULE - Develops into shoot system (first leaves)

(B)

- a. HUSK - As in ovary wall above
- b. SILK - Transfers pollen to ovules
- c. PEDUNCLE - Attaches cob to maize stalk (stem)
- d. SILK SCAR - Where silk attached to grain.
- e. FUSED PERICARP/TESTA - Protect the delicate inner parts from injury and pathogens. Form bran
- f. ENDOSPERM - Stores food (carbohydrates) for energy in Germinating seeds
- g. SCUTELLUM - Fleshy sheath, separates embryo from endosperm.
- h. COLEOPTILE - Sheath protecting the plumule (shoot) as it pushes via the soil at emergence.
- i. COLEORHIZA - Sheath protecting the radical via the soil at

(C) MANGO FRUIT

- a. EPICARP - Protects all inner parts from physical injury and Pathogens
- b. MESOCARP - Contains nutrients vitamins, sugar etc
- c. ENDOCARP - Protects the kernel (seed) from physical injury and Pathogens

(D) TOMATO FRUIT

- a. ENDOCARP - Protects seeds
- b. PLACENTA - For seed attachment
- c. MESOCARP - Contains nutrients

(E) INSECT POLLINATED FLOWER

- a. SEPAL - Protects upper part of flower.
- b. PETAL - Attract insects to collect flower nectar and transfer Pollen.
- c. RECEPTACLE - Holds all the upper parts of flower
- d. OVARY - Contains young seeds (ovules)
- Form fruit after fertilization.
- e. OVULES - Develop into seeds
- f. ANTHERS - produce pollen
- g. FILAMENT - Holds the anther
- h. STIGMA - It sticky to receive pollen grains
- i. STYLE - Transport pollen grain in pollen tube to the ovary ovules.

(F) LEAF (BROAD & NARROW)

- a. PETIOLE - Attaches leaf to the branches
- b. VEINS - Distribute water and salt for food making in green leaves
- Transport food

DEFINITIONS

- a. MONOECIOUS : Have both male and female flower parts in the Same (one) plant e.g. tassels and cob in maize.
- b. DIOECIOUS PLANT : Have their male and female flowers on separate Plants e.g. paw paws
- c. STAMENS : Ring forming male part of the flower
E.g. filament and anther.
- d. PISTIL : Female parts of the flower e.g. ovary (ovules) style and stigma.

NOTE

COTYLEDONS diminish or shrink or become smaller (the embryo uses the food they store before green leaves are developed for photosynthesis)

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ROOT STRUCTURE

- | | |
|---------------------|---|
| a. ROOT HAIR | Absorbs water and mineral salts |
| b. ROOT CAP | Protect the apical meristem. |
| c. APICAL MERISTEM | The growing point giving rise to all other parts of root |
| d. XYLEM | Conducts water and mineral salts to leaves |
| e. PHLOEM | Transports products of photosynthesis (food) from leaves to all parts of the plants. |
| f. EPIDERMIS | Hard cells protecting all the inner parts |
| g. CORTEN | Group of cells for food storage. |
| h. VASCULAR CAMBIUM | Cells separating Xylem from Phloem. |

STEM

BUD : Forms a shoot (branch)

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- | | |
|--------------|---|
| a. ANTENNA | : For sensing smell, heat and objects. |
| b. SNOUT | : For chewing feed |
| c. ROSTRUM | : For boring into grains or fruits. |
| d. MANDIBLE | : For cutting and chewing of feed |
| e. PROBOSCIS | : Pieces plant tissue to suck cell sap. |

*Also transmits virus causing Rosette disease

- | | |
|-----------------|--|
| f. ELYTRA | : Protects the abdomen and the wings and for flying. |
| g. SPIRACLES | : For gaseous exchange or breathing |
| h. COMPOUND EYE | : Has multiple eyes |

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RUMINANT ANIMALS

PART

FUNCTION

- | | |
|----------------------|---|
| a. OESOPHAGUS | : Passes feed from mouth into the rumen. |
| b. RUMEN | : Stores and ferments grass feed. |
| c. RETICULUM | : Sieves feed (sends back sand, wood pieces and cud) |
| d. OMASUM | : Absorb water and some nutrients like glucose |
| e. CARDIAC SPHINCTER | : Controls opening into the true stomach. |
| f. ABOMASUM | : Initiate chemical digestion of proteins |
| g. PYLORIC SPHINCTER | : Controls the opening out of the true stomach. |
| h. DUODENUM | : For protein digestion |
| i. PANCREAS | : Secretes pancreatic juice. |
| j. LIVER | : Secretes bile fluid. |
| k. GALL BLADDER | : Stores bile fluid. |
| l. BILE DUCT | : Passage of bile fluid into duodenum. |
| m. ILEUM | : Highest nutrient absorption zone of small intestine |
| n. CAECUM | : Contains microbes (fungi, bacteria, protozoa) for digestion of grass cellulose. |
| o. COLON | : Absorbs water and stores faeces. |
| p. RECTUM | : Temporary stores of faeces before ejected. |
| q. ANUS | : For exit of faeces. |

NOTE: ADAPTATION OF SMALL INTESTINE FOR ABSORPTION:

- a. Is very long (b) Has villi (c) Dense network of capillaries

DIGESTION IN BIRDS (CHICKEN)

- | | |
|-------------------|--|
| a. BEAK | : Strong for pecking feed. |
| b. CROP | : Stores and softens grain feed (maize) |
| c. PROVENTRICULUS | : For chemical digestion of proteins. |
| d. GIZZARD | : For grinding feed (physical digestion) |
| e. VENT | : For exit of faeces, eggs, urine and droppings. |

NOTE: ADAPTATIONS OF GIZZARD

- a. Has strong, thick muscular walls
b. Contains sand particles or grit to act as teeth.

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REPRODUCTION IN FEMALE CATTLE OR BOW

PART

FUNCTION

- | | |
|-----------|--|
| a. VULVA | : Opening into the vagina |
| b. VAGINA | : Receives the penis at coition |
| c. CERVIX | : Controls opening of passage into the uterus. |
- Closed up in pregnant female

- UTERUS** — Where the foetus develops (is implanted to its walls)
- e. UTERINE HORN : Drops the embryo or egg into the uterus.
 - f. OVIDUCT : Fertilization site.
 - g. FUNNEL : Receive eggs from ovary.
 - h. OVARY : Contains and releases ova (eggs)

IN A BULL (MALE CATTLE)

- a. SCROTUM : Protects testes from physical injury.
- b. TESTIS : Produces sperms (male gametes)
- c. SPERMATIC CORD : Supply food and oxygen to testes.
- d. EPIDIDYMIS : Stores sperms.
: Produces testosterone hormone.
: For sexual desire LIBIDO
- e. SPERM DUCT : Transports sperms up to the bladder.
- f. SEMINAL VESICLES : Produce semen (sticky fluid) that move sperms in urethra.
- g. URETHRA : Passage of semen (sperms) and urine.

IN A HEN (FEMALE BIRD)

- a. FIMBRIA : Receives eggs from ovary
: For fertilization (stores sperm)
- b. MAGNUM : Albumen is added to egg
- c. ISTHMUS : Egg membranes, mineral salt and water are added.
- d. SHELLGLAND : Porous shell is added. 18 – 21 hours
- e. VAGINA : Mucus seals up pores in the e.g. shell.
- f. VENT : Here egg is passed out (oviposited)

DIFFERENCES

- | COW | HEN |
|--------------------|-----------------|
| - Small egg | - Large egg |
| - Has no egg shell | - Has egg shell |

DIFFERENCES

- | BULL | COCK |
|----------------------------|--------------------------|
| - Has penis | - No penis (papillae) |
| - Testes out side the body | - Testes inside the body |
| - Has urethra | - Has ureter |

PARTS OF CHICKEN EGG

- a. SHELL : Protects all internal parts
- b. MEMBRANES : Form air space.
: Separate shell from inner parts.
- c. AIR SPACE : For gaseous exchange (oxygen used in chick respiration)
- d. YOLK : Stores mineral salts
- e. CHALAZA : Holds the yolk in a fixed position
- f. ALBUMEN : Stores proteins
- g. GERM LAYER : Where the embryo develops from

PREGNANT COW

- a. AMNIOTIC FLUID : Warms and cushions the foetus or embryo.
- b. PLACENTA : Supplies food and oxygen to foetus from mother
: Release co2 and urine from foetus to mother through diffusion

NOTE : Umbilical cord as in placenta.

Placenta (mother) and umbilical cord (foetus) are separated.

FLUID FILLED MEMBRANES SURROUNDING THE FOETUS ARE :

- a. AMNION : Water sac.
- b. CHORION : Surrounds the amnion.
- c. ALLANTOIS : Urine sac before the urinary bladder develops.

UNDER STRUCTURE IN COWS :

- a. ALVEOLUS : Synthesises milk using water, proteins, vitamins, carbohydrates.
- b. LOBES : Cavities that stores milk.
- c. MILK DUCT : Passes milk from alveolus to gland cistern.
- d. CISTERNS : Major milk store before ejected.
- e. TEAT CANAL : Passes milk out of the udder.
- f. SPHINCTER MUSCLE : Opens to ejected milk close the teat to stop milk release

- Milk is released when milking or suckling the young one.