•CLIMATE: Climate is the average weather condition of a place over a period of time. It includes light, temperature, wind, relative humidity, and rainfall. It is the climate that determines to a large extent, the type and number of animals that can be reared in a particular place. The high amount of rainfall in the southern Nigeria favours the growth of trees and forests while the low rainfall in the north favours only grasslands. The forest in the south harbours disease and pest. This accounts for the more availability of animals in the northern part of Nigeria where there is low incidence of disease and pest. It enables animals to thrive well as the area is free from tsetse fly that carries trypanosome which causes trypanosomiasis (sleeping sickness)among farm animals especially cattle and sheep.

WEEDS

A weed is any plant growing in a place where it is not wanted or planted. It can also be defined as an unwanted plant in our farm lands. In this regard, a wild plant and a maize plant growing on a cowpea field are both weeds. Likewise, a yam plant is not a weed on a yam field, but it is a weed on a sorghum field. Farmers , therefore, always strive to control weeds on their farms so as to reduce loses in crop yield. Weeds may be grouped as annuals, biennials and perennials depending on the length of time they take to mature and die. Furthermore, weeds may be grasses, shrubs, trees, aquatic plants, parasitic flowering plants etc.

CHARACTERISTICS OF WEEDS • > weeds, in their relationship with crops are

aggressive and persistent

- Weeds usually produce very large number of seeds to ensure their continuity and survival.
- They have very long dormancy period i.e. They remain viable in the soil for a very long time.
- They have modified parts, leaves, stems, roots and seeds which helps them to survive adverse weather/environmental conditions.
- Weeds are easily and efficiently dispersed by winds, water, animals and explosives mechanisms
- Weeds sometimes mature at the same time with crops, thereby falling into harvested seeds.

COMMON FARM WEEDS • Common name: Elephant grass

Botanical name: <u>pennisetum purpureum</u>

Description: This perennial grass grows very tall and can reach heights of two metres or more. Although a weed, it is a good pasture grass.

Habitat: Grows tall on its own, among several crops and across a wide range of soils. It also grows all year round but very vigorously during the rainy seasons.

Control: Burning or cutting the shoot are not lasting means of control. It is better to uproot the weed plants, gather and burn. On pastures, livestock should be allowed to graze on them from time to time so that they do not grow out of control.

- Common name: Guinea grass Botanical name: panicum maximum

  Description: perennial weed and pasture plant which grows very well from seed.

  Habitat: It may occur alone, along with other weeds and also among several crops across a wide range of soils.

  Control: Mechanical control which entails uprooting, gathering and burning the plants is very effective. Chemical control through the use of paraquat (a poisonous yellow herbicide) or other suitable herbicide is also effective.

- Common name: Spear grass or sword grass Botanical name: imperata cylindrica

  Description: a perennial which reproduces mainly from underground rhizomes. Its shoots are stiff and erect. The leaves have smooth margins and sharp, pointed tips.

  Habitat: Grows mainly on farmlands, lawns, roadsides and bushes.

  Control: Has difficulty in controlling it because of the dense network of underground rhizomes. However, the use of herbicides such as glyphosate continuously is preferable.

Common name: Siam weed

Botanical name: chromolina odoratum Description: This is a perennial broad-leaved plant.

Habitat: This weed grows in bushes and among field and plantation crops across a wide range of soils. it

seriously competes with crops for nutrients and easily overcomes any crop if there is no effective control.

Control: It is recognized as one of the most problematic weeds as far as control is concerned. Manual weeding is only slightly effective in its early stage of development when its underground stumps are not fully developed. However, the best control method is through the use of herbicides such as paraquat.

Common name: Goat weed

Botanical name: ageratum conyzoides

Description: This weed grows erect, about a metre tall, has hairy stem and branches, and leaves which are 8cm long and 4cm wide. The flowers may be blue, violet or white.

Habitat: This weed thrives in the wetter parts of the tropics, especially where the soils are thick and loamy. It invades many field and plantation crops such as cereals, legumes, vegetables, sugarcane and coffee.

Control: Application of chemicals such as MCPA, and herbicide known as 2, 4, 5-T

Common name: Pigweed

Botanical name: amaranthus spinosus

Description: This plant has an erect stem, bearing simple alternately positioned leaves. Possess sharp spines on the stem which can prick human beings and animals. Dull coloured flowers grow at the apex of the plant

Habitat: Species of this weed grow well among various field crops, especially maize, guinea corn and millet. Locally, it is known as *tete* in yoruba language.

Control: Tillage is an effective control measure, especially when the plants of the weed are still young.

Common name: Bermuda grass Botanical name: cynodon dactylon

Description: This is a creeping perennial grass. It develops underground rhizomes which form a network over an area.

Habitat: Grows well on sandy, clayey and loamy soils. It occurs frequently among plantation crops. It also thrives well both in the dry and wet regions of the tropics.

Control: Measures need to attack both the shoot and root systems of this weed in order to be effective. Tillage is good for uprooting its rhizomes and bringing them to the soil surface. They can be collected and destroyed. Application of herbicides have equally proved to be successful. Cultural method include the use of cover crops and the practice of a carefully designed crop rotation system.

Common name: crowfoot grass

Botanical name: dactyloctenium aegyptium

Description: It is a grass having runners which creep along the soil surface. Some of the stems grow erect, reaching heights not exceeding half a metre.

Habitat: Grows often on dry sandy soils which are bare of vegetation. On farms, it thrives among annual and perennial crops as well as pastures.

Control: Application of herbicides is the most effective method of controlling this weed. The weed can be killed by spraying the leaves with propanil and paraquat

USES OF WEEDS

Even though weeds disturb our crops on the farm,

some of them are useful to us in the following ways:-

Ø Some weeds are taken as medicine to cure some of our ailments

ØSome grasses, are used as forage crops for feeding animals e.g. Medicago sativa, alfalfa.

ØSome weeds also act as cover crops by protecting the soil and fixing some nutrients , like nitrogen into the soils. Examples include centrosema, mucuna etc.

Ø Some weeds serve as vegetables and are eaten by man.

EFFECTS OF WEEDS ON CROPS AND ANIMALS

Weeds compete with agricultural crops for water,

light, plant nutrients and space thus preventing the crops from getting the right amounts of these essential resources.

The following are some of the effects of weeds on crops and animals.

> Weeds cause reduced crop yields: Weeds negatively interfere with the growth and development of crop plants by shutting out light from seedlings, extracting soil moisture and plant nutrients e.g. Striga which grow and feed on crops and may at times strangle the crop to death.

- Reduction in the quality and market value of farm products:- Crops such as cereals, animals hides contaminated with goat weed, and wool contaminated with seeds of cocklebur weed sell less in the market because of their reduced quality.
- Weeds add to the burden of crop and animal production
- They are hosts of plant diseases and pests.
- Weeds may harm livestock and human

  beings.

CROP PEST

A n agricultural pest is any organism which is a threat to agricultural production. Such organism may attack crops and animals by disturbing their growth and development, transmitting disease to them, or destroying them completely.

Agricultural pests are numerous. They include various kinds of micro-organisms, lower plants, weeds, insects, rodents, birds, other animals, etc. Even certain activities of man are destructive to agriculture and therefore can be classified as pestiferous. Of all these pest, insects inflict the greatest damages on crops and animals. Therefore, insects are the most prominent agricultural pests.

INSECTS

Insects are animals without backbone (invertebrates). Their bodies have segments and are divided into head, thorax and abdomen. Every insects has three pairs of jointed appendages (legs) attached to the thorax. Several insects also possess a pair of long sensory devices called antennae located on their heads, some insects have wings while others do not. The head contains the eyes and mouth parts. Most species of insects produce many eggs, a lot of which metamorphose or transform into young ones. Majority of insects inflict damage on agricultural crops, while some affect livestock. However insects are beneficial to human beings in some ways – pollination of flowers, and produce some useful materials such as honey and

silk from honey bee and silk worm respectively.

CLASSIFICATION OF CROP PESTS Crop pest are classified based on their mouth parts. They use their mouth to destroy the crops on the farm and in the store during their feeding. These crop pests can be divided into three groups known as:

ØPiercing and sucking insect pests ØBiting and chewing insect pests ØBoring pests.

PIERCING AND SUCKING INSECT PESTS This group of insects include white flies, aphids, mealy-bugs, cotton stainer, butterflies, moths, scale insects etc. These insects have mouth parts modified to pierce and suck the sap and tissues of tender crop plants. They cause damage to the plants in the process, thereby reducing the growth of the plant.

Some of the insects also suck the juice of the young crop plants during which they inject poison or toxic saliva into the plant thereby causing diseases to the crops. These insects do not bite leaves, but create an opening on the crop and suck the juice.

BITING AND CHEWING INSECT PESTS The class of insect pests include locusts, grasshoppers, termites, mantis, cockroaches, and nymphs. They feed on leaves and young stem of plants. They cause a lot of damage by retarding the growth of crop plants. Also, the yield from such crops will be very low thereby leading to the death of the plant.

Their mouth parts are specially adapted to biting and chewing reducing the effective photosynthetic area of the plant (on the leaves) and disrupts transportation of food nutrients to different parts of the plants.

BORING PESTS

The pests in this category include weevils and beetles, butterfly. These pests attack harvested seeds and tubers. The grains that are kept in the store are damaged by weevils. The weevils feed on maize, beans, soybeans and sorghum. They use their long mouth parts (proboscis) to bore holes into the grains. Beetles also bore holes on yams and potatoes in storage.

The damage done by these boring pests reduce the market value of the grains and tubers. They also reduce the viability of the grains. The grains will not germinate when used for planting purpose because of the damage done to them. Boring pests multiply rapidly in the store.

EFFECTS OF INSECTS PESTS ON CROPS

Insects pests affect crops in many ways: some of the effects are the following:

HARMFUL EFFECTS:

Ø They interfere with crop performance: Insect pests eat leaves, buds, and other parts of plants shoots.

Ø Reduction of quantity and quality of crops

Ø Vectors of diseases: Several insect pests carry pathogenic organic to crops. The insects are therefore known as vectors, the organisms known as agents, and the crops are known as hosts of diseases.

Ø They add to the burden of agricultural production: huge amount of money are spent yearly to suppress or eliminate the activities of pests on the farm. Such money could have been used in other productive ways.

BENEFICIAL EFFECTS

- Insects take part in pollination: Pollination is an essential part of the process of sexual propagation of crops and other flowering plants. Insects pests, in the course of their natural activities of sucking nectar, sap and other food from crops, perform pollination. Wind and rain can also perform the process of pollination.
- Production of useful materials: the materials are honey and beeswax from honeybees, natural silk from silkworm, shellac used as a wood finishing material is obtained from scale insects.

- Natural enemies of other pests: Certain insects feed on or destroy smaller insects pests. An insects which preys on other insects of a different kind is called a predator. If there were no natural insects predators, the problem of pests would have been much more severe.

METHOD OF CONTROLLING INSECTS PESTS

1. Cultural method: Ø Crop rotation
Ø Insect resistance varieties Ø Time of planting
Ø Soil cultivation (Tillage system) Ø Irrigation
2. Chemical method e.g. Pesticides, stomach poison, fumigants etc
3. Biological method: Use of natural enemies to suppress pests.
4. Physical and mechanical method

FIELD PESTS

Common Name: Grasshopper and locusts

Hosts Plants: Maize, Guinea Corn, Millet and other grass like grains.

Damage Caused: Insects eat up the leaves of crops.

Economic Importance: Destruction of large areas of crops within a few days

Control Measures: Chemical method are most effective against grasshoppers and locusts.

Common Name: Termites, White ants

Hosts Plants: Termites attack both annual and perennial plants. Sorghum, maize, groundnut, beans, cassava, cotton, sugarcane, potato and rice are common host annual plants. Examples of perennial hosts are citrus, palms, mango, guava, cocoa and banana.

Damaged Caused: some termites eat up plants roots and other underground edible portions of crops. Plants attack usually die soon after. Other species attack the bark of trees, eat up leaves and penetrate to cause harm through wounds on their stem.

Economic Importance: huge quantity of crops and woody plants are lost every year. Termites also causes havoc to buildings and wooden structures. They equally help in the improvement of soil fertility in decomposing of soil organic matter.

Common Name: Cowpea and Groundnut Aphid Scientific Name: *Aphis craccivora*

Hosts Plants: Most legumes such as cowpea, soya beans, pigeon pea, and groundnut

Damage Caused: Attack by the pests allows virus diseases to gain access to host plants. Stunting, mottling, mosaic etc are noticed.

Economic Importance: Reduction of yield

Control Measures: Chemical methods are most effective

Common Name: Cocoa capsid

Scientific Name*: Distantiella theobroma*

Damage Caused: Various kinds of lesions (injury) occur on the stem pod of the host. When the lesions split, fungi, viruses, caterpillar, and other organisms penetrate the plants and various kinds of diseases occur.

Economic Importance: Reduction of yield

Control Measures: Various methods of control are used for cocoa capsids. Cultural method involve proper spacing of new plants such that they form close canopies as a defence against capsids and other insect pests.

Common Name: Ants

Host Plants: Perennial crops such as cocoa, citrus, coconut, coffee, plantain, guava, mango, oil palm, avocado pear etc.
Annuals crops such as groundnut, millet, and cotton

Damage Caused: Wilting of pods in cocoa. Reduction of yield.

Economic Importance: Reduces crop yield

Control Measures: Chemical methods are most reliable, although mot perfect.

STORAGE PEST Common Name: Maize Weevil Scientific Name: *Sitophilus zeamais*

Stored products attack: Cereals grains, especially maize, guinea corn, millet, rice.

Damage Caused: The larvae develops inside the grains, metamorphose into adults eating up the grains from within and creating holes which break through the grain walls.

Economic Importance: Loss of large quantity of stored maize grains. Seeds intended for planting will not be viable.

Control Measures: Grains should be shelled or removed from cops and completely dried before storage. An insecticide known as malathion is also very useful for protecting grains against this pest

Common Name: Cowpea Weevil

Scientific Name*: Callosobruchus maculatus*

Stored products attacked: Cowpea, soya bean, groundnut, and some other legumes.

Damage Caused: eggs laid transforms into larvae, pupa adults. The adults burrows holes through the grains the pest also deposits excrements seen as dots on the grain surfaces. Severely infected grains develop offensive smell.

Economic Importance: Destruction of stored cowpea yearly.

Control Measures: Chemical methods are most reliable although not perfect.

OTHER IMPORTANT PESTS OF CROPS

Apart from insects, there are some other animals which are crop pests, though their impact are not as much as that of insects. Such pests are as follows:

ØBirds

ØRodents: Rats, Mice, Squirrels, and such mammals with large, chisel-like incisors (front teeth)

ØOther vertebrates: Goat, sheep, Monkeys, Lizards etc.

SIMPLE FARM TOOLS

Agriculture or farming . Is carried out through the use of

tools and implements. An agricultural tool is an instrument used to carry out one or more specific physical task on the farm such as cutlass, hoe, sickle etc.

TYPES OF FARM TOOLS

HOE: This is a basic tool used by most farmers to till the soil. It consists of a wooden handle which may be short or long, and a metal blade which varies in width, length and weight. Hoes are used for turning the soil and making ridges, mounds and nursery beds and for opening up irrigation channels. It is also used for weeding and removal of roots

- CUTLASSES: This tool is used for bush clearing and weeding, cereal and root crops cutting, stem cutting of trees and shrubs, making planting holes, preparing stem cuttings and slaughtering of animals.
- SPADES: The spade consists of a rectangular metal blade into which is fitted a wooden shaft fitted with a handle. The spade is used for digging, planting holes, digging drains, turning the soil and removing rubbish and stones etc.
- SHOVEL: Similar to the spade but has a thinner hollow blade with a heart shape. It is used for packing soil, manure and rubbish. It is also used for loading materials into wheel barrows and trucks

- HAND TROWEL: The trowel resembles a shovel but it is much smaller. It is used for transplanting seedlings, digging small holes on nursery beds, and mixing manures and fertilizers with the soil.
- RAKE: The rake has a wooden handle and a head with metal teeth or prongs set along a bar. It is used for levelling ridges and soil surfaces, for breaking down lumps of soil into finer particles and for removing stones and rubbish from beds.
- AXE AND PICK AXE: The axe is used for cutting down trees, chopping wood, for splitting logs, cutting roots and for stumping operations. The pick axe is used for breaking up heavy soil, removing large stones from the ground and for digging out tree stumps and roots.

- GARDEN FORK OR DIGGER: The garden fork has four large teeth called prongs which are attached to a string and long wooden handle. It is used for loosening the soil, turning manure during compositing, carrying loose materials and spreading manure.
- HAND FORK: A hand fork is a smaller kind of garden fork. It is often used in home gardens.
- WATERING CAN: It is used for watering seed boxes, potted plants, nursery beds, and seedlings freshly transplanted.
- HEAD PAN

- GARDEN SHEARS: The shears resembles a large pair of scissors but has a wooden or metal handles. They are used for trimming hedges and shrubs.
- SECATEURS: The secateurs consists of two short metal blades (one convex) attached to the stout handles. The blades cross in operation, both cutting through the branches. It is used for light pruning of fruit and trimming borders of plants.
- MATTOCK: the mattock looks like a pick axe but has a flattened hoe-like blade replacing the pointed end of the pick axe head; the other part has a narrow axe-like blade. The mattock is used for stumping and removal of roots and tree stumps.

- SICKLE: The sickle consist of a short wooden handle fitted to a curved metal blade. It is shaped like a question mark. The sickle is used for harvesting cereal crops like rice, millet, sorghum, and for cutting forage for livestock.
- HARVESTING KNIFES
- BUDDING KNIFE: It is used for cutting, budding and grafting operations.
- FILE: The file is used for sharpening blunt farm tools like cutlasses, hoes etc.
- WHEELBARROW: This implement is used for transporting farm materials like fertilizers, soil, harvested crops, manures, debris and other farm tools

FISHING TOOLS

- HOOKS: Materials used in this method are hook, rope twine (line), sinker, which is a heavy object that ensures that the hook stays below the water, the rod to which is attached and the bait which attracts the fish. Examples of bait are earthworm, snails, fish, red soap, groundnut cake, insect larvae etc.
- FISHING NETS: This involves the use of nets of the right mesh size for catching fishes in larger quantities. The different types of fishing nets include: cast and throw nets, siene nets, lift nets and drag nets.

- FISH TRAPS: They are V shaped traps with a value around the mouth of the trap to prevent the fish which have been caught in the trap from escaping. It is made of woven from bamboo, cane, raffia, oil palm or coconut palm fronds or wire mesh.
- FENCES: Portions of shallow water are screened with fences, made of raffia/oil palm fronds, bamboo or coconut fronds the fences are made in such a way that fishes can enter the enclosed area at high tide. When the water is very much reduced at low tide, the fish can no longer escape, so, they are collected by the fisherman.

- FISHING BASKETS, POTS AND GOURDS: Some fisherman, when fishing in ponds and shallow lakes like lake Argungu, place clay pots, gourds and baskets in water to catch the fish which enter them.
- FISHING SPEARS, HOOKS AND KNIVES: Fishing spears are called harpoons. They are made of sharply pointed metal prongs attached to a long wooden handle. The spear may have one, two or three prongs for piercing and wounding fish. The wounding equipment include arrows and knives.