



OBJECTIVES

At the end of this chapter, students should be able to:

- â—† state the meaning of weeds.
- â—† list various types of weeds with their botanical names.
- â—† state the effects of weeds on crops and the economy.
- â—† list the features of weeds.
- â—† describe the various methods of controlling weeds.

11.1 introduction

Weeds are plants growing where they are not planted and together, they constitute a very important biological factor that affects crop productivity. This is because they compete with crops for nutrients, space and moisture. Weeds can be annual in which case they complete their life cycle within a year. They are biennial if they complete their life cycle in 2 years or perennial weeds when they grow for many years. Weeds must be controlled in order to have a good harvest

11.2 Meaning of Weeds

A weed is a plant growing where it is not wanted. Weeds compete with planted crops for nutrients, space, moisture and light. They may attack crops in diverse ways by clinging round and choking the crop. They may climb and strangulate crops or by their population overcrowd crops with their root elongation and expansion. Weeds generally cause damage to planted crops. It is therefore a necessity to control weeds in order to obtain a reasonable harvest. The term weed is broad in meaning. For example, a plant may be a weed in one place or situation but may not be in another situation or circumstance. A maize plant growing but not planted in a yam farm is a weed. Weeds interfere with production goals by reducing the growth and yields of crop, hindering farm operations and eventually causing reduction of the financial value of harvested produce.

11.3 Types of Weeds and Their Botanical Names

Weeds are diverse ranging from the grasses and legumes to other types of herbs and shrubs. The common weeds found in farms, their common names and botanical names are shown in Table 11.1:

TABLE 11.1 Examples of common weeds

Common Name	Botanical Name
Goat weed	<i>Ageratum conyzoides</i>
Guinean grass	<i>Panicum maximum</i>
PWD weed	<i>Tridax procumbens</i>
Milk weed	<i>Euphorbia heterophilla</i>
Bahama grass	<i>Cynodon dactylon</i>
Broom weed	<i>Sida acuta</i>
Carpet grass	<i>Axonopus compressus</i>
Sensitive plant	<i>Mimosa pudica</i>
Spear grass	<i>Imperata cylindrica</i>
African marigold	<i>Aspilia Africana</i>
Northern gamba	<i>Andropogon gayanus</i>
Southern gamba	<i>Andropogon tectorum</i>
Stylo	<i>Stylosanthes gracilis</i>
Calopo	<i>Calopogonium mucunoides</i>
Sunhemp	<i>Crotalaria juncea</i>
Puero	<i>Pueraria Phaseoloides</i>
Sedge plant	<i>Cyperus rotundus</i>
Wild amaranthus	<i>Amaranthus spinosus</i>
Pig weed	<i>Boerhavia diffusa</i>
Centro	<i>Centrosema pubescens</i>
Elephant grass	<i>Pennisetum purpureum</i>
Pink weed	<i>Spigelia anthelmia</i>
Blue feather	<i>Commelina nudiflora</i>
Corn grass	<i>Rottboellia cochinchinensis</i>
Water lettuce	<i>Pistia stratiotes</i>
Siam weed	<i>Chromolaena odorata</i>
Node weed	<i>Synedrella nodiflora</i>
Water hyacinth	<i>Eichhornia crassipes</i>
Mexican sunflower	<i>Tithonia diversifolia</i>
Umbrella plant	<i>Cyperus alternifolius</i>

11.4 Effects of Weeds on Crops

1. Weeds compete with crops for space: Weeds have rapid seedling growth and establishment.

They rapidly crowd and smother the crops thereby reducing the space for healthy growth of the crops.

2. Weeds compete with crops for nutrients: Roots of weeds develop faster than that of crops and remove considerable proportion of the available plant nutrients, thereby resulting in stunted growth of the plant.



FIGURE 11.1 Common weeds

3. Weeds compete with crop for sunlight: Plants need energy from sunlight to manufacture their

food. Weeds because of their rapid growth cause shading of crops, thereby reducing the amount of sunlight needed to manufacture their food.

4. Weeds compete with crops for soil moisture: Roots of weed are capable of growing faster thereby removing large portion of soil moisture needed for the normal crop growth. This can result into wilting of crops and eventual death.

5. Weeds compete with crops for soil air: Some weeds develop long roots which remove considerable amount of oxygen needed for crop root respiration.

6. Some weeds are parasites to planted crops: Weeds can attach and grow on the crop and suck its juice until the crop is killed. Examples are striga weed and the hemi-parasitic plants such as mistletoes.

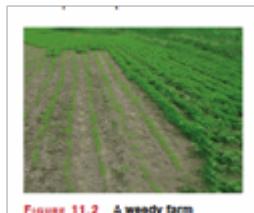


FIGURE 11.2 A weedy farm

7. Some weeds are poisonous to animals and human beings when consumed: Some can cause stomach upset and bloat in animals. Some can cause itching. Example is the witch weed.

8. Weeds serve as alternative hosts to insects, pests and diseases: For instance, elephant grass harbours stem borer, which can be transmitted to maize plants

11.5 Effects of Weed on the Economy

1. Weeds reduce crop yield: The resultant effects of weed competition with crops is reduction in the quantity of crop yields.

2. Reduction in crop quality: Weeds and their seeds mix with crops during harvesting, reducing the quality of harvested crops. For example when *Amaranthus spinosus* mix with the planted Amaranth, the quality is reduced. This affects the market value of the crop.

3. Reduction in farmers' income: Weed competition results in low yield. The low yield coupled with the reduction in crop quality results in loss of income to the farmer.

4. Weed control increases the general cost of agricultural production: Huge amount of money is spent in buying and applying herbicides to kill weeds.

5. Weeds hamper water ways making navigation difficult: For example, problem of water hyacinth, water lettuce and water lily.

6. Some weeds serve as alternate hosts to crop pests: For example, *Aphis* sp lives on *Chromolaena odorata* whether cowpea and other host crops are not in season.

7. Some weeds also harbour predators of fish and greatly disturb fishing activities. Example is the water hyacinth.

8. Some weeds are toxic to farm animals and can lead to death.

11.6 Uses of Weeds

1. Some grasses such as *Panicum maximum* are used as forage crops for feeding animals.

2. Some weeds such as waterleaf serve as vegetables and are eaten by man.

3. Some weeds such as *Centrosema* and *Pueraria* act as or are used by man as cover crops for protecting the soil from erosion.

4. Leguminous weeds such as *Pueraria* fix atmospheric nitrogen into the soil.

5. Some weeds are used to prepare compost and green manure.

6. Some weeds such as *Senna occidentalis* have allelopathic effects because they produce exudates

that affect seeds of other weeds

7. Some weeds are used in herbal medicine to cure various ailments

11.7 Characteristic Features of Weeds

Weeds possess the following characteristics:

1. **Rapid seedling growth and establishment:** Weeds tend to grow faster than crop plants and they can rapidly crowd and smother crops.
2. **High seed output:** Many weeds such as *Sida acuta* and *Tridax procumbens* produce numerous seeds which are easily dispersed from one place to another.
3. **Ability to survive under extreme environmental condition:** For example, *Sida acuta* can survive in slab.
4. **Efficient dispersal mechanism:** Weeds possess various appendages for dispersal. These include hooks, spines and wings.
5. **High regenerative ability:** Some weeds such as spear grass have high regenerative ability; this makes them difficult to control.

6. **Weed seeds have very long dormancy period:** Some weeds can remain viable in the soil for a very long period of time.

11.8 Methods of Controlling Weeds

Weeds can be controlled in the following ways.

1. **Physical control:** This involves the use of hand, cutlass, hoe and other materials to remove weeds.
2. **Mechanical control:** This involves the use of tractor coupled implements like plough and harrow to till the soil. As this is done, the weeds are uprooted and they later decay and form organic matter.
3. **Biological control:** This involves the use of living organisms such as plants, vertebrate animals, insects and even pathogens to control weeds. Some animals like cattle can feed on weeds, thereby controlling them. Some insects can also feed on the leaves of weeds.
4. **Chemical control:** This involves the use of chemicals called herbicides to control weeds.

Herbicides may be grouped into several categories based on

1. Their mode of action
2. Time of application

Classification of herbicides based on mode of action

Herbicides can be classified based on their modes of action as follows.

- a. **Selective herbicides:** These are herbicides that kill specific types of weeds. For example, 2,4-dichlorophenoxyacetic acid kills broad leaf weeds.
- b. **Non-selective herbicides:** These are herbicides that kill both broad leaf and narrow leaf weeds such as round up, paraquat and gramoxone.
- c. **Systemic herbicides:** These are herbicides which when applied on the pinot, the active ingredient goes into the system of the weed. They ensure total eradication such as Primextra, fusillade super imazaquin.
- d. **Contact herbicides:** These herbicides such as paraquat and diquat kill the parts of the plant on which they fall. They burn the weed immediately as they come in contact with it.

Classification of herbicides based on time of application

- a. **Pre-emergent herbicides:** These are herbicides applied immediately after planting or almost 3

days after planting. Examples of these herbicides are primextra, diuron and galex.

b. Post-emergent herbicides: These are herbicides applied after the crops and weeds have emerged. Postemergent herbicides are contact in action. Examples include paraquat and diquat.

5. Cultural Control: Cultural methods of controlling weeds include the following.

a. Crop rotation: This is effective for controlling weeds associated with specific crops. For example *Euphorbia heterophylla* constitutes a serious problem of cowpea and soya bean; it is, however, ineffective on cassava and maize plots.

b. Mulching: This involves the covering of the soil or foot of a plant with materials such as dry gasses, leaves, saw dust and plant residue. The mulch prevents weeds from sprouting and smothers those that have sprung up.

c. Flooding: Flooding subjects the roots to anaerobic condition thereby killing them.

d. Burning: This involves setting the vegetation on fire during land preparation thus killing the weeds.

e. Cover cropping: This involves the planting of fast growing leguminous crops such as *Calopogonium mucunoides* to act as cover and smother weeds.

f. Use of clean seeds: Seeds to be planted must be free from weed materials and their propagates.

Activity

Guide the student to make a weed album by first collecting common weeds from the school farm or premises. Arrange the weeds in cardboard singly, put identification labels and allow to dry.

SUMMARY

â—† Weeds are plants growing where they are not planted and together, they constitute a very important biological factor that affect crop productivity.

â—† Weeds can be annual in which case they complete their life cycle within a year; biennial, if they complete their life cycle in 2 years or perennial weeds when they grow for many years.

â—† The effects of weeds on crops range from competition with crops for space; for nutrients; for sunlight; for soil moisture; for soil air to being parasites to planted crops. Some weeds are poisonous to animals and human beings when consumed and some serve as alternative hosts to insects, pests and diseases.

â—† Weeds generally cause damage to planted crops.

â—† It is therefore a necessity to control weeds in order to obtain a reasonable harvest.

â—† Weeds are diverse ranging from the grasses and legumes to other types of herbs and shrubs.

â—† The effects of weeds on the economy include reduction in crop yield quantity and quality as well as increasing the general cost of agricultural production.

â—† The uses of weeds include as forage crops for feeding animals; as vegetables by man; fix atmospheric nitrogen or to prepare compost and green manure.

â—† Characteristic features of weeds include rapid seedling growth and establishment, high seed output, ability to survive under extreme environmental condition; efficient dispersal mechanism; high regenerative ability and very long dormancy period.

â—† Methods of controlling weeds are physical control; mechanical control, biological control and chemical control.

REVISION QUESTIONS

Essay Questions

1. Define weed and list ten types of weeds.
2. State five adverse effects of weeds on crops.
3. Explain five ways by which weeds can be controlled by cultural method.
4. State four ways by which herbicides may be classified based on mode of action.
5. State six adverse effects of weeds on the economy.

Objective Questions

1. The covering of the soil or base of a plant with materials such as dry gasses, leaves, saw dust and plant residues is called
 - (a) leaching.
 - (b) mulching.
 - (c) dressing.
 - (d) covering.
2. A weed that completes its growth and life cycle in 1 year is called
 - (a) annual.
 - (b) biennial.
 - (c) triennial.
 - (d) perennial.
3. A weed that completes its growth and life cycle in 2 years is called
 - (a) annual.
 - (b) biennial.
 - (c) triennial.
 - (d) perennial.
4. A weed that grows for several years on the farm is called
 - (a) annual.
 - (b) biennial.
 - (c) triennial.
 - (d) perennial.
5. Cultural methods of controlling weeds include the following except
 - (a) mulching.
 - (b) use of living organisms.
 - (c) cover cropping.
 - (d) burning.
6. The following are major characteristics of weeds except
 - (a) slow rate of growth and poor competitive ability.
 - (b) ability to survive under extreme environmental condition.
 - (c) high regenerative ability.
 - (d) efficient dispersal mechanism.
7. Herbicides are classified based on their modes of action into the following except
 - (a) selective herbicides.
 - (b) non-selective herbicides.
 - (c) fumigant herbicides.
 - (d) systemic herbicides.

Answers to Objective Questions

1. b 2. a 3. b 4. d 5. b 6. a 7. c