10. Weed Management

Can you recall?

- Tell the weed plants observed in your area.
- Why are the weeds considered as enemies of crop plants ?
- List out the harmful plants to the crop ?
- Can you differentiate weed from crop plant ?

Farmers sow the seed in field and take care to obtain produce from that. The plant grown in the field (cultivated plants) by farmer are called as crop. Some plants grow without putting any seed and competing to the main crops for nutrient, water and space that makes heavy loss of crop yield, such plant are considered enemy of crop which causes huge loss of yield and favour other enemies as pest, diseases, wild animals, etc. These plant enemies are called weeds.

Fig. 10.1 : Weed free plot

Fig. 10.2 : Weed infested plot

Weeds are unwanted, useless, prolific, competitive and often harmful to the human beings. Weeds are undesirable as they not only compete with crop for nutrients, moisture, space and sunlight but also interfere with agricultural operations (labour, tillage). It also affect the yield and quality of farm produce. Weed seed may get mixed with main crop seed. These weed plants are required to be uprooted before flowering stage. Therefore management of weeds at right time is necessary.

Use your brain power

Complete following table with the information from your surroundings.

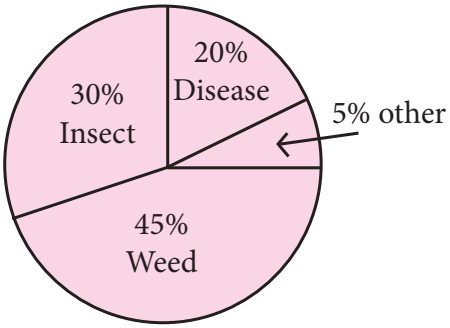
Sr. No.	Crop Plants	Weeds
1.		
2.		
3.		
4.		
5.		

10.1 Definition of weed

The most common definitions of weeds are :

- Weed is a plant growing where it is not desired.
- Any plant not sown in the field by the farmer and which is out of place is known as weed.
- Weed is a noxious, unwanted, undesirable plant in the field.

Annual loss in agriculture produce (%).



Always remember

- Jethro Tull was the first person to use word Weed.
- In India 45% of agricultural loss is due to weeds.
- Clean field always pays higher.

Understand and remember

- Weeds are considered as enemy of Crops.
- Weeds are very difficult to eradicate completely.
- Weeding is carried out in every crops.

10.2 Characteristics of weed

1. They are unwanted and undesirable.
2. Weeds are harmful to crop, cattle and human beings.
3. The weed seed germinate early and grow very fast.
4. They flower earlier, produce more quantity of seed and mature earlier or late than crop and their separation become difficult.
5. They being hardy, compete with crop plants for nutrients, moisture, space, sunlight and reduce the crop yield.
6. They can thrive even under adverse conditions of soil, climate and biotic stress.
7. Viability of weed seed remain intact, even they are buried deep into the soil and passes through digestive track of the animals.
8. Weeds are prolific with abundant seed production capacity.

   e.g. Striga, Hazardana, Piwla Dhotra
9. Weed seed have special structure like wings, spines, sticky, hairy, light weight, free flowing and hooks, etc. on account of which they can be easily spread.
10. Some weeds are propagated vegetatively e.g. : Doob, Kans, Lavala, etc.
11. Some weed seed are very similar to crop seed and therefore their separation become very difficult. e.g. : Mustard seed with seed of Piwla Dhotra
12. They are persistent and resistant to control and eradication.
13. Some weeds have deep roots they store food in their rhizomes and reappear every year
14. Some weeds have similar morphological characters like crops therefore escaped from weed control. e.g. wild rice, wild oat.
15. Some weed seed have long dormancy period and have a hard seed coat and hence not loose viability.

Beware that the weeds have varied characters and structures.

Try this

Activity - Survey residential area, waste land, cropped land and collect weeds, prepare an album and label.

Use your brain power

- Classify the plants or crops on various aspect.
- Classify the weeds on different aspects.
- Give special identifying characters of weed.

Do you know ?

- Weeds are specific for a particular location.
- Weeds are seasonal as well as periodic.

10.3 Classification of weeds

10.3.1 According to life cycle

(a) Annual weeds : These weeds grow and mature within a season.

1. **Kharif season weeds :** They appear with the onset of monsoon (June / July) and complete their life cycle when rainy season is over (Oct. / Nov.) e.g. Cocks comb, math, dudhi, hazardana, parthenium, chimanchara, etc.
2. **Rabi season weeds :** Weeds grow during winter season and finish their seed production before summer starts. e.g. bathua, ghol, vasantvel, etc.
3. **Summer season weeds :** Summer season weeds complete their life cycle during summer season (Feb / May) e.g. *Solanum nigrum* (kamuni), *Argemone mexicana*.
4. **Multiseason weeds :** They occur almost at any time of the year. e.g. *Eleusine indica* (Goose grass) *Phylanthus niruri* (Bhuiaonla).

(b) Biennial weeds : These weeds live for two seasons. They complete vegetative growth in first season and produce flowers and seeds in the next season. These are mostly found in temperate climate. e.g. Jangli gobhi, wild carrot, wild onion, wild brinjal.

(c) Perennial weeds : They require more than two years to complete their life cycle. e.g. nutgrass, hariyali, johnson grass, wild ber, ghaneri, kans, motha or lavala.

10.3.2 According to place of occurrence

(i) Weeds of cropped lands : e.g. dudhi, chandvel, vasantvel, cocks comb, bathua, etc.

(ii) Weeds of pastures and grazing lands : e.g. parthenium, hulhul, hariyali, etc.

(iii) Weeds along water channel : e.g. jalkumbhi, pandhari phuli, maka, ekdandi (Jakhamjodi), etc.

(iv) Weeds along rail and roadside : e.g. : tarota, gokhru, parthenium, chubh kata, etc.

(v) Weeds of waste land : e.g. wild ber, rui, babhul, parthenium, etc.

(vi) Weeds of lawns and orchards : e.g. : *Cannabis sativa*, ambooshi, ghol, etc.

(vii) Weeds of forest lands : e.g. *Lantana camara* (ghaneri) tantani, chillari.

10.3.3 According to plant family

1. Gramineae : e.g. hariyali, kans or kunda, chiman chara, etc.
2. Leguminosae : e.g. lajalu, shewara, senji, tarota, takala, etc.
3. Solanaceae : e.g. wild brinjal, kateli or kateringani, etc.
4. Euphorbiaceae : e.g. All types of dudhi (*Euphorbia spp.*)
5. Liliaceae : e.g. wild onion
6. Convolvulaceae : e.g. chandvel, hirankuri, undirkani, etc.
7. Compositeae or asteraceae : eg : parthenium, maka osadi, pandhari phuli, pohli.

10.3.4 According to dependence on other host

1. Stem Parasites : e.g. amarvel, loranthus on mango.
2. Root Parasites : e.g. gudiya, stringa, bambakhu on tobacco, etc.
3. Independent : e.g. chandvel, vasantvel, hirankuri, etc.

10.3.5 According to soil type

1. Weeds found in black soil : e.g. hariyali or doob, kans, kunda, etc.
2. Weeds found in sandy loam or light soils : e.g. aghada, chhoti dudhi, cockscombs, chirchiri, etc.
3. Weeds found in ill drained soils : e.g. maka, nutgrass or lavala.
4. Weeds in tanks, ponds, rivers or aquatic weeds : e.g. jalkumbhi, typha, hydrilla, *salvinia spp*, lotus, algae, etc.

10.3.6 According to mode of cultivation

1. Weeds of dry land : e.g. chimanchara, kombada, etc.
2. Weeds of irrigated land : e.g. lavala, hariyali, ghol, etc.

10.3.7 According to morphology

[i] Broad leaf weeds : These are mostly dicots having broad leaves with netted venation alternately arranged on stem e. g. bathua, common purslane, spiny, amaranth, etc.

[ii] Grasses : Cylindrical and hollow stem having node and internodes, leaf emerge from node that are long, narrow upright with parallel veins, fibrous roots, gramineae family e.g. bermuda grass, barnyard grass, etc.

[iii] Sedges : These are monocots like grasses but leaves occurring two rows. Triangular stem, no nodes, very large internode and leaf at top, no branch usually three leaves at top. e.g. motha, purple nut, etc.

[iv] Algae : This is a large and diverse group of simple photosynthetic plants. eg. chlorella, *spirogyra cladophora*, etc.

[v] Ferns : These are seedless vascular plants which produce spores. e.g. *Ceratopteris Siliquosa*, *Marsilea crenata*, *Salvinia molesta* etc.

10.3.8 According to association

Association of weeds with crops and seasons they are classified as :

[i] Season - bound weeds : They grow in specific season of the year irrespective of the crop species cultivated. e.g. Johnson grass and Canada thistle.

[ii] Crop - bound weeds : These are usually parasite on the host crop. eg. cuscuta, orbanche, etc.

[iii] Crop - associate weeds : Weeds associate with certain crops. They grow with crop due to their requirement, habitat and survive along with the crop in the form of mimicry. eg. Wild oat, canara grass, barnyard grass, etc.

10.3.9 According to origin of weeds

[i] Foreign origin (Alien Weeds) : piwala dhotara, wild carrot, water hyacinth, etc.

[ii] Indigenous origin (Apophytes) : bermuda grass, purple nut, jungle rice, kans, etc

[iii] Introduced by Man (Anthrophytes) : *Avenahido viciana* (wild oats), *phalaris minor* (canara grass), *corchorus acutanqulus*, etc.

10.3.10 According to nature of stem

[a] Aerial Stem :

[i] Herbs : lambs quarter, bhringraj, etc.

[ii] Shrubs : pethari, jelly leaf, etc.

[iii] Bushes : Jungln ber, wild jujube (Toran)

[iv] Trees : pimpal, banyan

[v] Filamentous : chiman chara, water horse tail

[b] Sub aerial stem :

[i] With storage organs :

eg. 1. Nuts - purple nut
2. Rhizomes - sonkadi

[ii] Without storage organs :

eg. 1. Runners - oxalis
2. Stolons - aaloo
3. Offsets - pankobi

Use your brain power

- Why some weed seed float on water ?
- Whether the structure of weed seed that helps in dispersal ?

Try this

Collect different samples of Weed and Weed seeds from surrounding area.

10.4 Dispersal of weeds

Weeds are hardy and vigorous than crop plants, grow faster and spread so rapidly, therefore difficult to eradicate completely. Weed seed and fruits are dispersed very fast in various ways. Wind, water, animal, man and farm machinery are the principal agencies of weed seed dissemination.

1. **Wind :** Many weed seeds are light in weight with special structural modifications like parachute, wings, chaffy, silky hairs, balloons, etc. due to which they disperse to a long distance e.g. rui, Jakham jodi, agrimone mexicana, milk weed, ground cherry, etc.

Fig. 10.3 : Dispersal of weeds by wind

2. **Water :** Some weed seed have special structures to float on water. Surface run off from the fields carry weed seeds during rainy season. Irrigation and drainage channels are also important in spread of weeds. Streams and flood water carry weed seeds to long distance. e.g. lavala, motha, gajar gawat, chubkata, etc.

3. **Animals and birds :** Many weed seed are eaten by animals, birds and spread from one place to another through excreta. Many weed seed do not lose their viability even after passing through digestive track of birds and animals.

   Weed seed having spines, awns, hooks or sticky hairs may get attached to the body of animals and spread from one place to another. e.g gokhru, hooks, lantha, aghada, kusal, etc.

4. **Man :** Man himself is also responsible for the spread of weeds. Farmer use partially decomposed F.Y.M., compost or silage containing weed seed, feeding cattle with fodder having weed plants. Movement of uncleaned farm machinery, import food grains, vegetables, seedlings, etc. contaminated with weed seed.

5. **Farm machinery :** Farm implements carry weed seed from field to field and from one area to another.

6. **Crop seed :** Many times weeds are also harvested and threshed along with the main crop. If seed from such source is used for sowing in the next year. It get dispersed.

7. **Others :** Weeds are also commonly spread through transport vehicles, manures, compost pits, soil mass and weeds used for mulching, etc.

Collect Information : Collect information about weeds from your parents, books and internet.

Let's discuss

- Discuss between two groups in your class about advantages and disadvantages of weeds.
- What will be the overall effect of weeds on field crops ?
- What will be the effect of weeds on animals and human beings ?

Try this

Prepare a list of beneficial and harmful weeds.

Always remember

- Along with Insect-Pest, Plant diseases, animals and weeds also cause considerable damage to agriculture crops.
- The estimated losses in crop yields alone range from 5 % in clean field to over 70 % in neglected fields.
- The losses of nitrogen through weeds as high as 150 kg / ha.
- There are over 30,000 species of the weeds around the world, out of these about 18,000 species are known to cause serious losses.

10.4.1 Effects of Weed

[A] Harmful effects of weed

[1] Yield losses : Weeds germinate earlier, seedling grow very fast, produce large amount of seeds, weeds are hardy and vigorous in growth habit. It compete with crops for plant nutrients, moisture, space and sunlight. It consume large amount of water, nutrients and causes heavy losses in crop yields. Sometimes complete loss may occur. The annual agriculture loss in India due to weeds is estimated to 45 %.

[2] Increase in the cost of cultivation : When the land is infested with weeds, the cost of tillage increase, i. e. repeated tillage operation and more labour is also required for weeding. Finally results in increasing the overall cost of cultivation and reducing the margin of the net profit.

Tillage operations are done to control weeds and generally 30 % of the total expenditure for crop production is incurred on tillage operations.

[3] Incidence of the pest and diseases : Weeds act as alternate hosts to pest and pathogens during off season, which infect the crop later and cause severe damage.
e.g. Wheat - (Black Rust) → *Agropyron repens* (Quak grass).
Tomato - (Wilt) → *Amaranthus spp*.

[4] The quality of produce is reduced : weed seeds get mixed with the main crop seeds, when crop is harvested and reduce the quality.

[5] The quality of livestock produce is reduced : Certain weeds e.g. wild onion, wild garlic, parthenium, piwali tilwan when eaten by cattle, it impart an undesirable flavor and bitter taste to milk. Weeds like gokharu get attached to the body of sheep and affect the quality of wool.

[6] Problems of human health : Some of the weeds cause health problems, allergic reactions. e.g. parhtenium causes irritation of skin and allergy. Mixture of Mexicana in mustard seeds cause dropsy, string needle causes severe itching and inflammation, fever and asthma may caused by *franseria spp*.

[7] Problems of animal health : Many weeds are poisonous to animals when ingested. *Lantana camara* induces

hypersensitivity Johnson grass at tillering stage is poisonous. Sweet clover act as antiblood coagulant. Kala dhotra may cause death of cattle. Weeds with thorns or spines may cause injury to animals while grazing.

Fig. 10.4 : Dhatura spp.

[8] Problems of water contamination : Weeds block drainage and check the flow of water in irrigation channels and field channels. It increases seepage losses as well as losses through overfloding. Aquatic weeds render water unfit for drinking. After its decomposition, it emits offensive odors and pollute the atmosphere. Aquatic weeds create difficulty in fishing and navigation.

[9] Weed secretions are harmful : Heavy growth of certain weeds like nut grass, johnson grass vasantvel, amaranths. lower the germination and reduce the growth and yield of many crop plants. This is due to certain allopathic compounds or phyto toxics released by the weeds in the soil.

Fig. 10.5 : Chaulai

[10] Weeds cause quicker wear and tear of farm implements : Weeds are hardy and having deep root system, the tillage implement get worn out early and cannot work efficiently unless they are properly sharpened or repaired.

[11] Weeds reduce the value of land : Agricultural lands which are heavily infested with perennial weeds like kans always fetch less price, because such lands cannot be brought under cultivation without incurring heavy expenditure on labour and machinery.

[12] Many weeds lower the beauty of Public Places

Do you know the weeds : Pathri, ghol, jakhum jodi, gumma, *maka*, *bramhi*, *rui*, *argemone spp*. etc.
How these weeds are benificial ?

Beneficial effects of weeds

[1] Add nutrients to the soil

Several species of weeds having vigorous and leafy growth are used as green manuring. Some wild leguminous weeds fix atmospheric nitrogen. Aquatic weeds are used for making compost. It adds considerable amount of organic matter and plant nutrients into the soil.

[2] Fodder value of weeds

Several weeds of grasslands used as fodder for animals. Some weeds have succulent leafy growth good for milch animals. e.g. Hariyali, chimanchara, shewari, etc.

[3] Vegetable value of Weeds

Some weeds like math, kanjru, tandulja, amaranthus, pathri, ghol, etc. are used as green leafy vegetables at many places.

Fig. 10.6 : Pathri

Fig. 10.7 : Ghol

[4] Medicinal value of Weeds

Some weeds are used in the preparation of certain drugs or medicines.

e.g. gumma - used in the snake bite. maka - cough disorders and as hair oil. argemone spp - oil is used against skin diseases. rui - Good medicine for gastric troubles.

Striga, Orobancho - for treatment of diabetes. Bramhi used for preparation of brain tonic and ayurvedic oil, etc.

Fig. 10.8 : Maka

Fig. 10.9 : Rui

Fig. 10.10 : Bramhi

[5] Religious value of weeds

e.g hariyali, aghada, maka, lavala etc. are used in religious ceremonies.

[6] Economic importance of weeds

Kans, are used for thatching of huts, lavala for making essence sticks (Udbattis) and lemon grass for aromatic oils. Some weeds protect different types of farm bunds, especially in soil and water conservation.

[7] Reduce Erosion

Weeds growing on desert lands, waste lands and sloppy lands in the heavy rainfall areas, sloppy fields, lowers wind and water erosion and helps in protection of environment.

Fig. 10.11 : Kans

[8] Reclamation of alkali soils

The application of powder of piwala dhotra @ 2.5 tonnes / ha is useful for reclamation of alkali soils and there by increasing the yield.

[9] Source of resistance to pests and diseases

Weeds have been a constant source of new genes for resistance to pests and diseases. e.g. wild grass has conferred cold tolerance to bread wheat, resistance of potato to nematode. Some weeds useful for controlling nematodes when mixed into soil. e.g. Rui, parthenium, etc.

[10] Weeds can be used for preparation of paper pulp, biogas and the manufacture of edible proteins.

[11] Weeds serve as ornamental and hedge plants

e.g. ghaneri, ghol, cactus, jalkumbhi, etc. produces beautiful attractive flowers and are used as ornamental plants or hedges.

Fig. 10.12 : Ghaneri

Fig. 10.13 : Jalkumbhi

Think about it

- What are your suggestions for minimizing weed growth ?
- Which chemicals are used to control weeds ?
- Which method is safe and effective ?
- How do you kill weeds naturally ?

Internet my friend

1. Collect information about different methods of weeds control.
2. Collect information about different trade names of weedicides.

10.5 Weed control

The process of minimizing weed infestation in cropped field for remunerative crop production is called weed control.

Different methods of weed control are as follows

I. Preventive measures
II. Curative Measures
   a. Mechanical methods
   b. Cropping or cultural methods
   c. Biological methods
   d. Chemical methods
III. Integrated weed management

Always remember

1. The golden rule in agriculture is "Prevention is better than cure".
2. Weed prevention is cheaper than weed control.

10.6.1 Preventive measures

The aim of this method is to prevent introduction and spread of specific weed species in areas that are not currently infested.

No weed program can be successful if proper preventive measures are not taken to minimize the weed infestation. Different measures adopted to prevent spread of weeds to minimize weed population are as follows.

Use your brain power

Why is it necessary to
a. Use clean seed for sowing.
b. Use well decomposed F.Y.M. / Compost.

1. Use weed free crop seeds and seedlings.
2. Do not use fresh or partly decomposed F.Y.M. or compost.
3. Remove weeds before flowering and seeding.
4. Remove weeds before raising crops.
5. Restrict livestock to move from weed infested area to clean area.
6. Use clean farm implements and tools before handlings.
7. Avoid shifting of soil from infested area to clean area.
8. Keep the threshing yard, compost pits free from weeds.
9. Follow legal and quarantine measures while importing crop seed, grains, seedlings, etc.
10. Use vigilance - Inspect your farm frequently for any strange looking weeds and destroy it immediately.
11. Keep the nursery stock free from weeds.
12. Keep river banks, hill slopes, field bunds and fence lines free from weeds.
13. Keep the irrigation and drainage channels free from weeds.

10.6.2 Curative measures or remedial measures

They are employed after the occurrence of weed . They are classified into four groups :

[A] Mechanical method or physical method

This is the common method of weed control, it started when man began to grow crops. Choice of each method depends on the location, extent and habitat of weeds. It includes -

[1] Hand weeding or hand pulling

It is a physical removal or pulling out weeds by hand. Weeds do not regenerate from pieces of root left in the ground. Weeds can be easily uprooted after good soaking irrigation or rain. Weeding should be done before flowering of weeds. This is costly and time consuming method.

[2] Hand Hoeing

Hand hoeing is a simplest weeding tool. It is effective on annuals and biennials weed growth can be completely destroyed. It is effective on shallow root system weeds.

[3] Tillage

Tillage operation such as ploughing, disking, harrowing and leveling for seed bed preparation.

[4] Digging

This method weed control is useful where other methods are not effective. It is very useful to remove underground propagating parts of perennial weeds from deeper layers of soil. It is costly and time consuming method.

[5] Sickling

It is used to remove top weed growth to prevent weed seed production.

[6] Burning

It is not a good method, since useful vegetation and organic matter is also destroyed along weeds. Fire is used to burn crop residues and weeds after the harvest of crops like sugarcane, cotton, maize, potato etc.

[7] Flooding

Weed infested field is ploughed deep and flooded with 20 - 30 cm standing water. Flooding is an efficient method of weed control for perennial weeds. The weeds are submerged under water and are smothered.

[8] Mulching

It has smothering effect on weeds by restricting the photosynthesis. It is effective against annual weeds. Generally organic mulches or polythene expensive sheet are used.

[9] Dragging

With the help of mechanical force, weeds are removed along with their roots and rhizome.

[10] Soil solarisation

During solarisation soil temperature is increased around 50^0 C. High soil temperature can suppress weed seed germination and kill weed seedlings.

[B] Cropping Or Cultural method

This method is relatively less expensive. It may not control weed completely.

However weed intensity can be reduced to some extent to improve crop yield. The main objective of cultural practices is to provide a short term relief to crop during initial growth period. So that the crop may taken lead in its growth and development.

Fig. 10.14 Croping and cultural method

Cropping and competition methods includes

1. Proper crop rotation
2. Clean cultivation
3. Suitable time and methods of planting crops
4. Use clean seeds and higher seed rate
5. Inclusion smoother crops such as legume in intercropping

6. Summer ploughing
7. Water and nutrient management
8. Mulching and crop residue management
9. Reduction in area under bunds and water channels
10. Line sowing for using inter cultivation implements

[C] Biological Weed control

Let's recall

1. What is meant by parasites and predators?
2. Are predators can be used for controlling weeds ?

Biological weed control involves the use of living organism (Bioagents) such as Insect, pathogens, herbivorous fish, other animal and competitive plants to limit the weed infestation. In this method natural enemies of weeds (Parasites, predators and pathogens) are employed to control weeds.

The objectives of biological control are not to eradicate but to reduce and regulate the weed population. A bio agent may be either specific or non specific.

Fig. 10.15 : Bio weed control

Fig. 10.16 : Bio weed control

Try to understand

Characteristics of bio agents

1. The bio agents must feed or affect or kill only host plant. (weed)
2. They do not feed or harm the crop.
3. It should be free from predators and parasites.
4. It must be able to kill the host or atleast prevent seed production or reproduction of host plant.

The example of biological weed control are given below

[1] Insects : Cactus or Prickly pear weed (opuntie spp) by- Cochineal insects. Ghaneri (*Lantana Camera*) by lantana bug.
aquatic weeds like water hyacinth by snails or sea cow.
parthenium by *zygogramma bicolorata*

[2] Fish : aquatic weeds - common carp and chinese carp.

[3] Fungi : water hyacinth - eichhomia crissipes fungus. (Rhizoctina blight)

[4] Mites : prickly pear - spider mite.

[D] Chemical Method

Chemical method is very effective in certain cases and have great scope in weed control. The chemicals are cheap, efficient and easily available. The chemicals which is used to kill or control weeds and their growth are called herbicides.

Advantages of chemical control method :

1. Most effective as compared to other methods.
2. It controls the weeds before crop emergence.
3. Highly suitable for close spaced crops.
4. Suitable for adverse soil and climatic conditions.

5. Control many perennial weeds which cannot be controled by other methods.

Collect Information about different weedicides / Herbicides available in the market from nearest 'Krishi Seva Kendra'.

Think about it

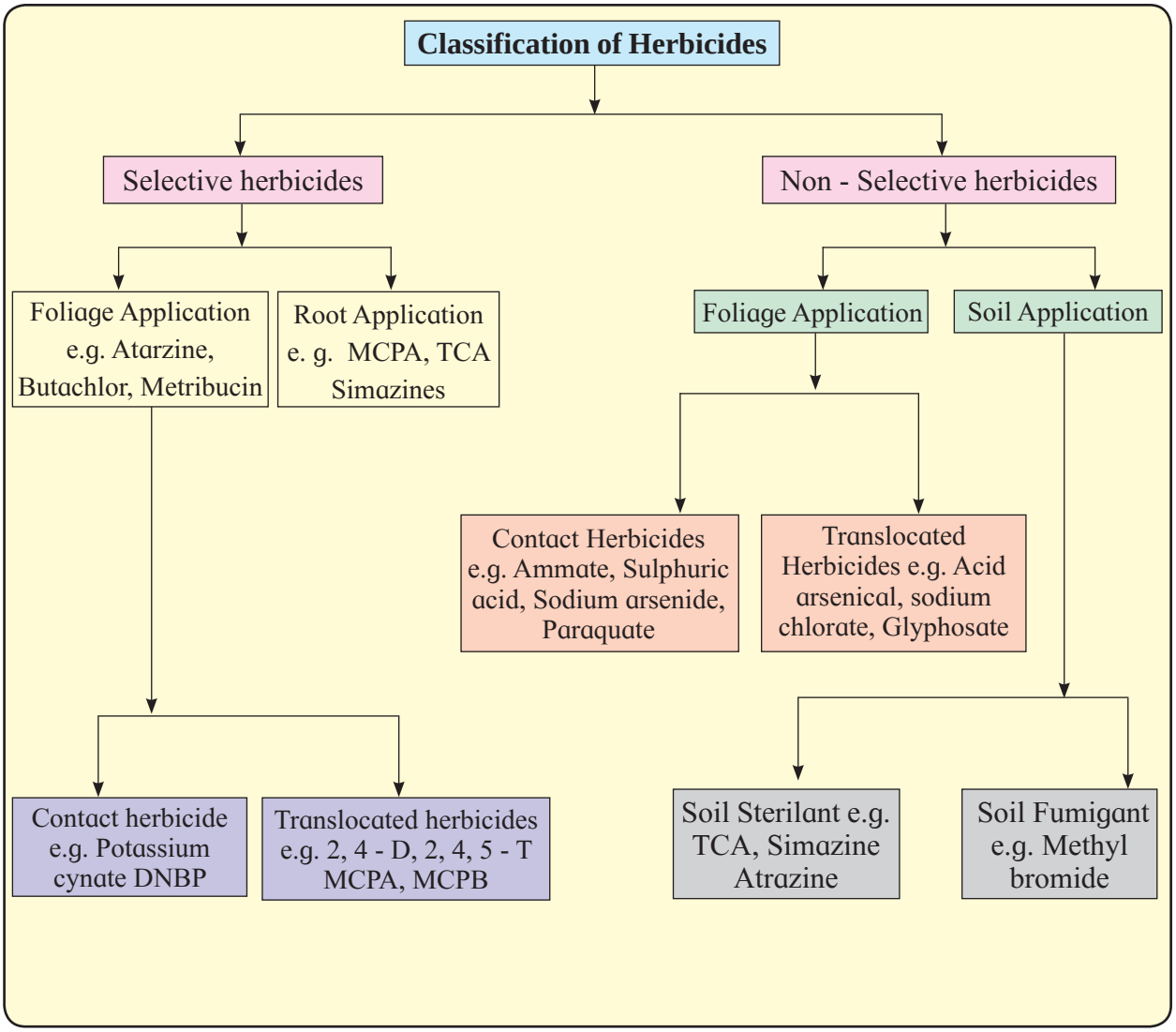
Select the best method of weed control from your point of view, which is good to the farmer by considering its costs, time, technique, skill, soil properties etc

10.6.3 Integrated Weed Management (IWM)

Integrated weed management is the suitable combination of all methods including preventive measures, mechanical, biological, cultural and chemical methods of weed control.

Importance of Integrated Weed Management

Weeds can be controlled by adopting different methods. However, each method has advantages and disadvantages or limitations. The continuous use of same method leads to built up of tolerant species. Therefore, the suitable combination of different methods of weed control or integrated use of weed management should be practiced for minimizing the losses caused by weeds.



Exercise

Q.1 A. Fill in the blanks.

1. Weeds can be controlled by preventive and -------- measures.
2. Any plant not sown by the farmer and is out of place called as -------
3. The chemical which is used to kill or control weeds is called as -------
4. The bioagent must feed or affect or kill only -------- plant.
5. The weeds which require more than two years to complete its life cycle is called as ----------

B. Make the pairs.

Group A	Group B
1. Mango	a. Dudhi
2. Jowar	b. Loranthus
3. Tobacco	c. Gokhru
	d. Bambakhu
	e. Striga

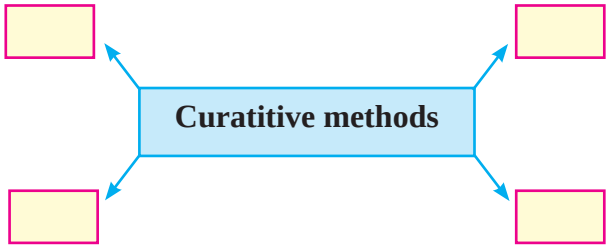
C. State true or false.

1. Biological method is most effective method than other methods of weed control.
2. Jethro Tull was the first person to use word weed.
3. Lavala is a weeds of ill drained soil.
4. Summer season weed appear with the onset of monsoon.
5. Weed also act as alternative hosts during the off season.

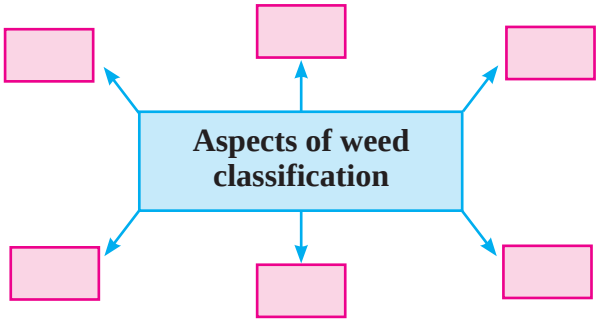
Q. 2 Answer in brief.

1. Write short note on Integrated weed management
2. How weeds are controlled by biological method ?
3. Classify the weeds according to dependence on other host.
4. Write benificial effects of weed.
5. Complete the following chart.

[a]



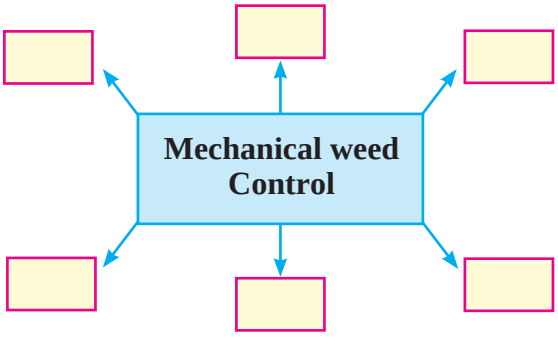
[b]



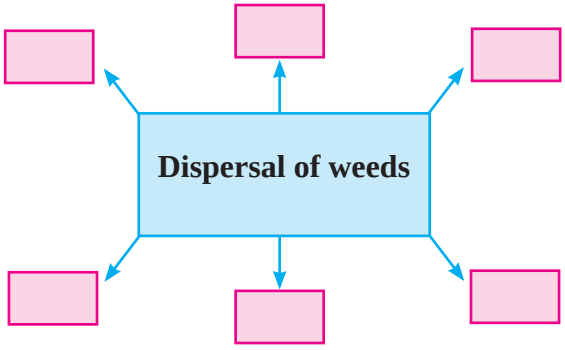
Q. 3 Answer the following questions.

1. Classify the weeds according to life cycle.
2. Describe in short-dispersal of weeds.
3. Write in short preventive method of weed control.
4. Write about harmful effect of weeds.
5. Complete the following chart.

[a]



[b]



Q. 4 Answer in detail.

1. Define weeds and give its characteristics.
2. Give detail classification of weeds with suitable examples.
3. Describe curative methods of weed control.
4. List out methods of weed control and describe any two of them.
5. Explain harmful and useful effects of weed .

Activity :

Practice different methods of weed control and prepare a concept map of weed control methods..

Concept Map