WEED MANAGEMENT

UNIT-1

- WEED
- HARMFUL EFFECTS OF WEED
- CLASSIFICATION OF WEED

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WEED

- **Weeds are the plants, which grow where they are not wanted** (Jethro Tull, 1731).**Weeds can also be referred to as plants out of place**.
- **Weeds are unwanted or undesirable plants** compete with crops for water, soil nutrients, light and space (ie CO2) and thus reduce crop yields.
- Weeds are competitive and adaptable to all the adverse environments. It has been estimated that in general weeds cause **5%** loss to Agricultural production in most developed countries. **10%** loss in less developed countries and **25%** loss in least developed countries.

Harmful effects of weeds

- The fallowing are the harmful effects of weeds on various activities of human beings, crops, livestock and related aspects.
- **1. Weed menace in agriculture**
- **2. Weed menace in animal husbandry**
- **3. Weed menace to human health**
- **4. Weed menace to aquatic ecosystems**
- **5. Weed menace to forest and pasture land**
- **6. Weeds as alternate hosts to crop pests and diseases**
- **7. Weeds reduce land value.**
- **8. Weeds limits choice of crops**

Classification of weeds

Weeds are classified

1. **Based on morphology**
2. **Based on life cycle**
3. **Based on habitat**
4. **Based on origin**
5. **Based on association**
6. **Based on nature of stem**
7. **Based on soil types**
8. **Special classification**

Classification based on morphology/ cotyledon characters

- The morphological classification is most important and useful in weed control. Morphological characters of plant are closely reacted to herbicidal absorption, retention, & translocation. The weeds belonging to the same group are likely to have same kind of response to specific herbicides or cultural or mechanical methods.
- This is the most widely used classification by weed scientists. So, weeds are generally divided into three groups

Grasses

Sedges

Broad leaved weeds

Based on cotyledon characters they are classified into

Monocots

1. Narrow and upright leaves
2. Parallel venation
3. Retention of herbicide is less
4. Adventitious root system
5. Growing point is open
6. Cambium (conductive tissue) is scattered

Eg Grasses or narrow leaved weeds

Dicots

1. Broad & horizontal leaves
2. Reticulate venation
3. Retention of herbicide is more
4. Tap root system.
5. Growing point is open
6. Conductive tissue intact

Eg: Dicots

Amaranthus spp.

Chenopodium album

Convolvulus arvensis

Note : Cyperaceae and typhaceae are not grasses even though they are narrow leaved

Classification based on habitat / situation

Depending upon the place of their occurrence they are classified into terrestrial and aquatic weeds. Terrestrial weeds are again classified into

1. Crop land weeds: weeds in field. Eg. *Echinocloa* in rice.

2. Non-crop land weeds: weeds in waste lands Eg. *Tribulus terrestris, Xanthium strumarium.*

*3.*Grass land weeds: Eg. *Vernonia and Rumex spp.*

*4.*Weeds of lawns & public parks Eg *Lippia nodiflora and Eleusine indica*.

5. Orchard or garden weeds Eg. *Euphorbia geniculata, Imperata Cylindrica , Acalipha indica.*

*6.*Weeds of plantation crops Eg. *Euphatorium spp. Makania micrantha*

7. Parasitic weeds Eg. *Loranthus.*

8.Aquatic weeds; They are classified into 1)Sub merged weeds Eg *Hydrilla Verticillata, Utricularia stellaris.* 2) Emerged weeds Eg *Typha Spp Nelambium speciosum.* 3) Floating weeds Eg *Eichhornia crassipes, Pistia stratiotes* .

Classification based on origin

- **Indigenous weeds**: All the native weeds of the country are coming under this group and most of the weeds are indigenous. Eg. *Acalypha indica, Abutilon indicum, Sorghum halepense, Cynodon dactylon and Echinochloa colonum*
- **Introduced or Exotic weeds or Alein**: These are the weeds introduced from other countries. These weeds are normally troublesome and control becomes difficult. Eg. *Parthenium hysterophorus, Acanthospermum hispidum, Eichhornia crassipes, Argemone mexicana, Lantana camara* and *Croton bonplandianus* **When man aids in its introduction such Weeds are called as a**nthrophytes.

Classification based on association

- When two plants are living together i.e called association. Based on association they are **season bound weeds, crop bound weeds and crop associated weeds.**
- **Season bound weeds**: They are seen in that particular season irrespective of crop. These are either summer annuals or winter annuals. *Sorghum halepans* **(Perennial) is a summer perennial and** *Circium arvense is* **winter perennial.** *Phalaris minor and Avena fatua* are winter season annuals.
- **Crop bound weeds**: Weeds which usually parasite the host crop partially or fully for their nourishment i.e parasitism also called as parasitic weeds. Those parasites which attack roots are termed as root parasites and those which attack shoot of other plants are called as stem parasites

1 Root parasites

a. complete root parasite eg *Orobanche* (broom rape)in tobacco

b. partial root parasite eg *Striga* spp (witch weed) on millets

2. Stem parasites

a complete stem parasite eg *cuscuta* (dodder) in lucern & burseem

b. partial stem parasite eg *Loranthus* in fruit crops

- **Crop associated weeds:** These are also crop specific due to m**imicry, need for specific micro climate and ready contamination with the crops.**

- **Mimicry**

If weeds look exactly like crops morphologically & complete their life cycle, *Echinochloa colonum* (Jungle rice) mimic the rice crop. *Avena fatuva (wild oat)* and *Phalaris minor* (canary grass) both mimic the wheat and *Loranthus* in tea gardens. For example *Avena fatua* (wild oats) tends to grow to the height of winter grains and adjusts its ripening period to the crop over a wide varietal range and this type of mimicry is called **phenotypic mimicry.**

- **Need for specific micro climate**

C*ichorium intybus* (chicory) and *Coronopus didymus*(swinecress) requires shady, moist & cool micro climate for their growth and development and which is available in lucerne and berseem crops.

- **Ready contamination with the crops**

If the crop seed mature at the same time & same height of the crop, then it contaminates the crop (also morphologically same) easily Eg. little seed canary grass (*Phalaris minor) and* wild onion, wild garlic (*Allium spp)*.

Classification based on nature of stem

Depending upon development of bark tissue on their stems and branches weeds are classified into w**oody, semi-woody and herbaceous weeds.**

- **Woody weeds**: Weeds include shrubs and under shrubs and are collectively called brush weeds. *Lantana camera, Prosopis juliflora* (mesquite) *Zizyphus rotundifolia* (wild plum) are examples for brush weeds.
- **Semi-woody weeds**: *Croton sparsiflorus* is semi woody weed.
- **Herbaceous weeds**: Weeds have green, succulent stems are of most common occurrence around us. Eg. *Amaranthus viridis and Chenopodium album*.

Based on soil Ph

Based on pH of the soil the weeds can be classified into three categories.

- **Acidophile** weeds habitat acid soils eg. *Rumex acetosella, Pteridium spp*
- **Basophile** weeds dominate Saline & alkaline soil eg.*Taraxacum stricta. Salsola* spp dominate saline soils where as *Cressa erecta*, *Sporobolus* diander are dominant in alkaline soils.
- **Neutrophile** – Weeds of neutral soils eg. *Acalypha indica*

Classification based on life cycle / ontogeny

Based on life span (ontogeny), weeds are classified as annual, biennial and perennial weeds.

- **Annuals**
- **Biennials**
- **Perennials**

Annuals: Completes its life cycle within one year or one season and propagate by seeds. They may be Kharif annuals, winter annuals and summer annuals.

Biennial weeds: Complete their life cycle within two years/ two seasons, 1st year vegetative growth – Rosette stage. 2nd year produced inflorescence called bolting. They may propagate either by seeds or vegetative parts or by both.

Perennial weeds -Grow more than two years. Reproduce vegetatively from under ground and specialized organs. First time they come to flowering in 2nd year and there after flowering every year.

Special classification

- **Poisonous weeds**: The poisonous weeds cause ailment on livestock resulting in death and cause great loss. These weeds are harvested along with fodder or grass and fed to cattle or while grazing the cattle consumes these poisonous plants. Eg. *Datura fastuosa, D. stramonium*
- **Submersed weeds***:* These weeds are mostly vascular plants that produce all or most of their vegetative growth beneath the water surface, having true roots, stems and leaves. Eg. *Utricularia stellaris, Ceratophyllum demersum, Hydrilla Verticillata*
- **Emersed weeds***:* These plants are rooted in the bottom mud, with aerial stems and leaves at or above the water surface. The leaves are broad in many plants and sometimes like grasses. These leaves do not rise and fall with water level as in the case of floating weeds. *Typha Spp* . Eg. *Nelumbium speciosum,*
- **Facultative weeds:** Also called **apophytes**. Weeds that grow primarily in wild community and migrated to crop fields or cultivated environment and associating themselves closely with the man's affairs, behave like more competitive weeds. Eg. *Opuntia dilleni*
- **Obligate weeds:** Occur only on cultivated land or other wise disturbed land. They can not withstand competition from volunteer vegetation in a closed community.

- **Noxious weeds**

These weeds are arbitrarily defined as being undesirable, trouble some & difficult to control. They have immense capacity of reproduction & high dispersal capacity. They adopt tricky ways to defy man efforts to remove them. These weeds are also known as **special problem weeds.**

Eg. *Cyperus rotundus. Cynadon dactylon, Circium arvense, Parthenium, Eichhornea crassipes, Lantana camara, Saccharum spontaneum, Imperata cylindrical and Striga spp*

- **Objectionable weed**

It is a noxious weed whose seed is difficult to separate from the crop seed after contamination is called objectionable weeds.


THANK YOU