

## Experiment 5

**To identify the major weeds of crops and methods of herbicide application**

➤ Any plant not sown in the field by the farmer and grow where they are not wanted is called a weed.

➤ Weeds are like any other crop plants in size, form, morphological and physiological characters but possess the following characteristics on account of which they are considered as enemy of crops.

➤ *Father of weed science: Jethrotull*

## Identification and field Observations

### Morphology of the plant

- **Leaf:** Color, size, shape, arrangement
- **Stem:** Color, size, nature (erect, prostrate, angular trailing etc.) nodes and internodes, solid, hollow, woody, tender
- **Branches:** Branched, unbranched, pattern and arrangement
- **Flowers:** Color, size, type of inflorescence
- **Roots:** Shallow, deep, tap root, adventitious, root color, rhizomes, ground parts: nuts, bulb.

- **Juncture points:** Note the color, shape, size of any plant part like hair, ligule, auricle, glands etc. present at the joining point of stem with root, leaf with stem, inflorescence, with the main stem / branch etc.
- **Fruits / Seeds:** Color, size, shape.
- **Special points:** Nature of plant sap (milky, juicy, gum etc.) and its color, special modification on the plant etc.
- **2. Growth duration:** Annual / biennial / perennial.
- **3. Categorization in broad groups:** Grasses / sedges / broadleaf.
- **4. Nature:** Associated, crop bound, parasitic, facultative and obligate



➤ **Common name-**  
**Chotti swank**

➤ **Scientific name-**  
***Echinochloa colonum***

➤ **Family – Gramineae**

➤ **Mimicry weed**

➤ **Annual weed**





- **Common name – Swank**
- **English name- Barnyard grass**
- **Family – Gramineae**
- **Characteristics:** An erect annual weed, of troublesome nature in paddy fields. Resembles with rice plant during vegetative growth



- **Common name-** Niruri
- **Scientific name:** *Phyllanthus niruri*
- **Family:** *Phyllanthaceae*
- **Characteristics** : Annual herb, 30-60cm height, angular stem, compound small leaves, fruits capsules, very small, smooth

Q. Mimicry weed of rice

(a) *Echinochloa colonum*

(b) *Eragrostis tenella*

© *Phlaris minor*





- **Common name:** Kaun makki
- **Scientific name:** *Commelina benghalensis*
- **Family:** Commelinaceae
- **Morphology:** Broad leaved weed. Glabrous or pubescent, herb growing up to 60cm. Flowers of blue colour.



- **Common name:** Tandra
- **Scientific name:** *Digera arvensis*.
- **Family:** Amaranthaceae
- **Morphology:** Erect, annual herb becoming perennial with wide spreading branches, prostrate below. Common weed of dry lands, roadsides and waste places





- **Common name-**Bathu
- **Scientific name-** *Chenopodium album*
- **Family:** Chenopodiaceae
- **Morphology:** This is an annual weed, branched, erect, and pale green with strong smell, tap root system



- **Scientific name-** *Amaranthus viridis*
- **Family:** *Amaranthaceae*
- **Common name:** *Chulai, Pigweed*
- **Morphology:** Broad leaved weed. The plant is a perennial with long ascending branches and a woody main stem growing to a height of 30-60cm.





- **Common name-** Dila/ motha
- **English name-** Nut sedge
- **Family-** Cyperaceae
- **Scientific name-** *Cyperus rotundus*
- **Morphology:** Perennial weed, common weed of kharif crops, propagates through tubers, and rhizomes.





- *Cyperus difformis* ( umbrella nut sedge) , **small flower umbrella-sedge**
- **Family** – Cyperaceae
- **Morphology:** *Cyperus difformis* is a plant of moist habitats. It is a weed of rice fields, annual herb with one to many thin, soft erect stems reaching over 30 centimeters in maximum height. There are usually a few long, wispy leaves around the base of the plant.





- **Common name** yellow nut sedge
- **Scientific name:** *Cyperus iria*
- **Family:** Cyperaceae
- **Morphology:** Annual, fibrous roots, long leaves, smooth inflorescence spikelet

Q. Sedges belong to which family

(a) Gramineae

(b) Cyperaceae

© Chenopodiaceae



➤ ***Common name:***  
Congress Weed.

➤ ***Scientific name:***

***Parthenium hysterophorus***

➤ ***Family:*** Compositae

➤ ***Morphology:*** Broad leaved weed., Annual herb, up to 1.5 m.

➤ ***Propagation:*** Seed.

➤ ***Habitat:*** Cultivated fields and road side.





- **Common name** – Chirya da dana
- **English name**- Love grass
- **Scientific name:** *Eragrostis tenella*
- **Family**- Gramineae
- **Morphology:** shade loving grass, 18” height, slender stem





➤ **Common name-**  
Bhang

➤ **Scientific name:**  
*Cannabis sativa*

➤ **Family-**  
Geraniaceae

➤ **Herbaceous**  
smelling annual,  
3-8 foliate leaves



- **Common name-** Dodhak, Spurge
- **Scientific name-** *Euphorbia hirta*
- **Family-** Euphorbiaceae
- Annual, erect herb, 1-1.5 m height, Plant contains white milk, stem hairy, leaves opposite in pairs





- ***Scientific name: Cenchrus catharticus***
- **Common name- Lendhra/ kutta ghas**
- **Family- Graminae**

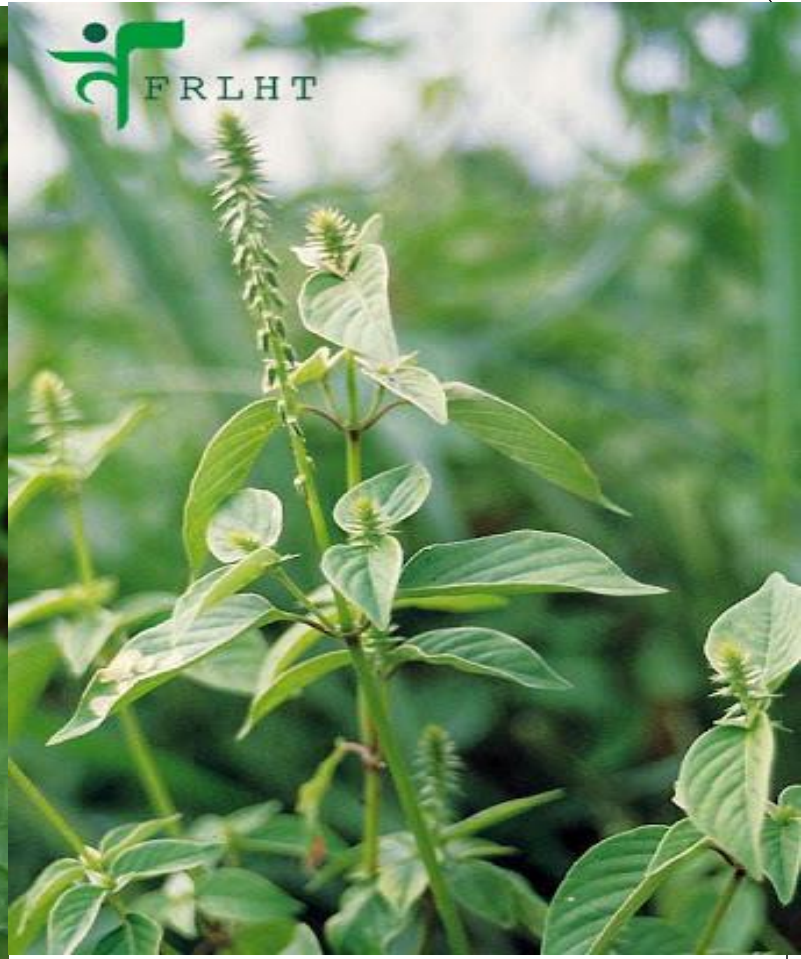
Q. Scientific name of umbrella nut sedge

(a) *Cyperus rotundus*

(b) *Cyperus difformis*

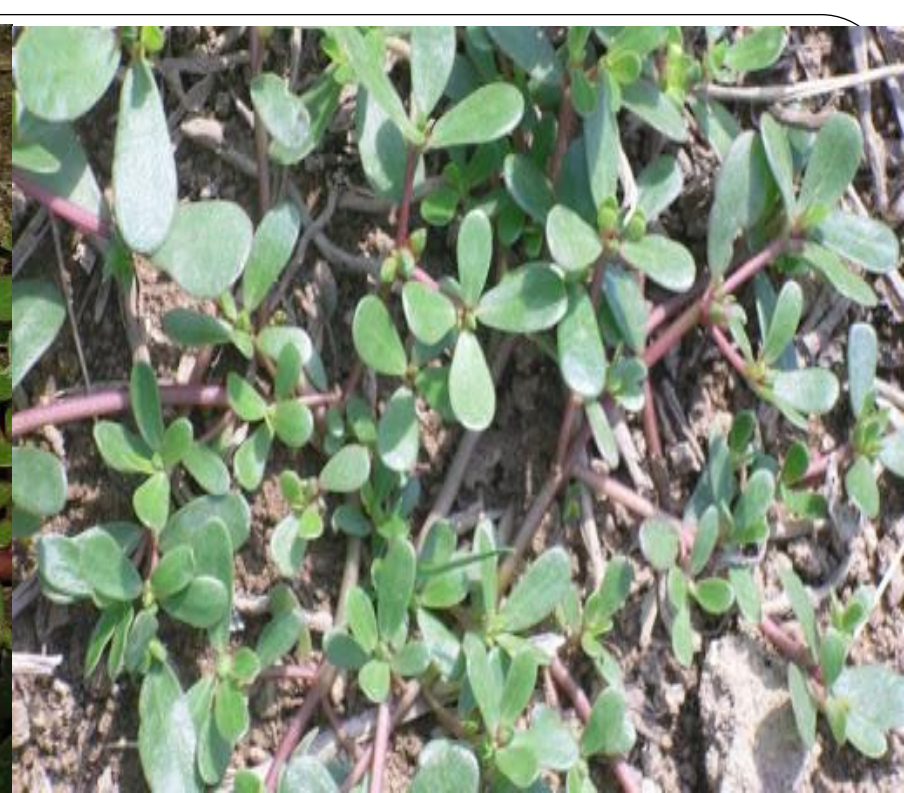
(c) *Cyperus iria*





- *Scientific name: Achyranthes aspera*
- *Common name- Puth kanda*
- *Family- Amaranthaceae*
- small erect annual shrub found distributed throughout the tropical and subtropical regions.





- ***Common name:*** Indian Purslane, Itsit
- ***Scientific name:*** *Portulaca oleracea*
- ***Family:*** Portulacaceae
- ***Morphology:*** Broad leaved weed.
- ***Habitat:*** In all dry areas





➤ **Common name-**  
madhana

➤ **English name-**  
Crow foot grass

➤ **Family** —  
Gramineae

➤ **Scientific name-**  
*Eleusine*  
*aegyptiacum*



➤ **Common name-** Billi booti

➤ **Scientific name-**  
*Anagalis arvensis*

➤ **Family -Primulaceae**

➤ Stem erect with 4 angled branches. Flowers very pretty-white or blue colour.





Also known as Bermuda grass, Dhoob, dūrvā grass.

**Scientific name:** Cynodon dactylon

**Family- Poaceae**



It is a long-lived (perennial) grass, forming thick mats by means of stolons and rhizomes (horizontal, root-like stem usually found underground)





www.shutterstock.com • 1647073534



- Common name: Gulli danda, canary grass
- Scientific name: *Phalaris minor*
- Family- Poaceae
- Rabi weed, annual, propagated through seed
- Mimicry weed of wheat





- Common names. **wild oat**.
- Family. Poaceae (Gramineae)
- *Scientific name: Avena fatua*
- **Wild oats** are erect grasses with long flat linear leaves. The inflorescences are typically large and loose and bear minute bisexual flowers.

Q. Scientific name of doob grass

(a) *Cynodon dactylon*

(b) *Phlaris minor*

(C) *Cannabis sativa*



- Common name: Satyanashi, mexiacn Poppy
- Scientific name: *Argemone mexicana*
- Family: Papaveraceae
- Prickly poppy is an erect, branched, annual to perennial plant with prickly stems and leaves, growing around 60cm tall



# Methods of herbicide application:

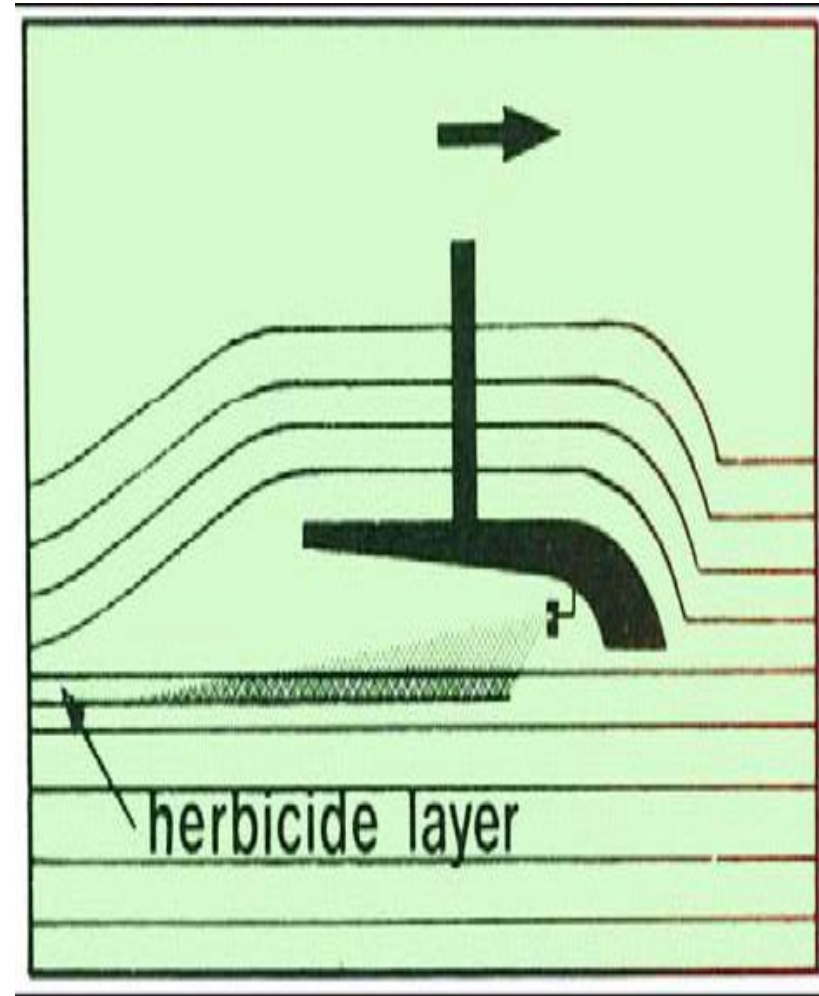
## Surface application:

- Soil active herbicides are applied uniformly on the surface of the soil either by spraying or by broadcasting.
- They may be either left undisturbed
- Eg. Butachlor, Pendimethalin, Atrazine, Alachlor or incorporated into the soil, physically. EPTC, fluchloralin, trifluralin and nitralin.



## ➤ Sub-surface layering:

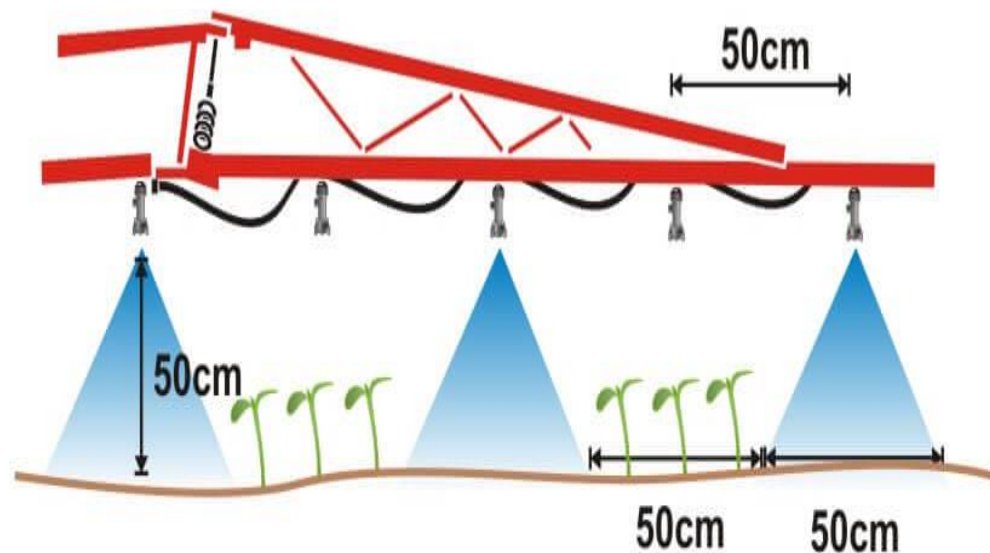
- It is the application of a herbicide in a concentrated band, about 7-10 cm below the soil surface.
- The technique has proved effective in controlling perennial weeds like *Cyperus rotundus* and *Convolvulus arvensis*.
- Eg Carbamate and nitrile herbicides, this is useful in orchards and vineyards, besides certain wide-row crops like sugar beet and tobacco





## Band application:

- Herbicide application restricted as band along the crop rows, leaving an untreated band in the inter-rows.
- The band application of herbicides is primarily a cost saving device since it reduces the quantity of herbicide in the ratio of the treated band width to the crop row width.



**Banded application with 80° even fans between planted rows.  
50% of the planted area receives spray**

# Soil fumigation:

Herbicides used for fumigation are called as fumigants. Depending upon the nature of the soil fumigant, it can be applied either

(1) By soil injection  
(Example, chloropicrin).

(2) By releasing it under sealed, plastic covers  
(Example, methyl bromide).





Q. Out of the following which herbicide is used in fumigation?

(A) Atrazine

(B) 2,4-D

(C) Methyl bromide

## ➤ Herbigation:

- Application of herbicides with irrigation waters both by surface and sprinkler systems.
- In India farmers apply fluchloralin for chillies and tomato, while in western countries application of EPTC with sprinkler irrigation water is very common in Lucerne





## ➤ **Methods of application of foliage-active herbicides**

- A foliage-active herbicide is applied to weeds after their emergence from the soil.
- They are absorbed by the plant foliage and these are translocated to the other plant parts.
- Eg 2, 4-D, 2, 4, 5-T, isoproturon, paraquat, diquat, MCPB, amitrole, and herbicidal oils are common examples of foliage-active herbicides.
- There may be some herbicides that are both soil-active and foliage-active, for example, 2, 4- D and atrazine.

# Blanket application:

- Blanket (or over-the-top) it is uniform application of herbicides to standing crops with disregard to the location of the crop plants.
- Only highly selective herbicides are applied by this method, e.g. 2,4-D in wheat. Rice, MCPB in pea, 2, 4-DB in Lucerne.





## Spot treatment:

- Spot treatment is the application of herbicides to small patches of weeds, leaving the weed-free gaps untreated.
- This is used for treating patches of noxious, perennial weeds in certain crop fields with potent herbicides.
- Spot treatment is of value also in the non-cropped areas to prevent wastage of herbicide in the weed-free spaces.



- <https://youtu.be/fdNgUsYpYzI>

- <https://youtu.be/OA8N3ZxYllI>