

Identification of Common Weeds in Vegetable Gardens and Preparation of Herbarium

EXERCISE

13.1 Identification of common weeds in vegetable gardens.

13.2 Preparation of herbarium of different weed plants growing in vegetable gardens.

Exercise 13.1: Identification of common weeds in vegetable gardens.

OBJECTIVE:

- Identification of common weeds of vegetable crops on the basis of different growth parameters and morphological attributes.

Delivery schedule: 02 periods.

Student's expectations/learning objective:

- To demonstrate the different principles to identify important weeds.
- Identification of common weeds growing in the fields of vegetable crops.

Pre-learning required: Knowledge about different crop weeds.

Handouts/material /equipment's & tools required: Paper sheet and pen to note down the instructions, hand lens.

Introduction:

Weeds are the unwanted and undesirable plants which grow voluntarily out of their place and compete with the cultivated plants for nutrients, moisture, light and space and thereby reduce the quality and quantity of the crop produce. Weeds can be classified and characterized on the basis of their life cycle, growing season, number of cotyledons, morphology, *etc.*

Procedure/methodology:

How to identify weeds in vegetable crops?

There should be some criteria on which one can identify the weeds in the vegetable fields. It is important to know the season in which the weed is growing, its life cycle, morphology *etc.* Keeping these criteria in mind, the weed plants can be classified as;

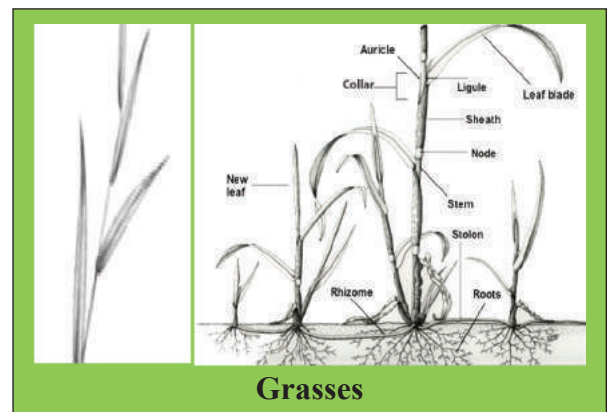
1. **Based on life cycle:** On the basis of life cycle, the weeds have been classified as annual, biennial and perennial weeds.
 - a) **Annual weeds:** Weeds of this group complete their life cycle in one season or in a year and thus are called annual weeds. They are usually small herbs with shallow root system and weak stem. In general, most of the common weeds are annual. They are further divided into two groups based on their occurrence in different season.
 - i. **Monsoon annuals (*Kharif season*):** Monsoon annuals are the weeds which emerge with the onset of rains and complete their life cycle before winter season or so. The seeds remain dormant in the soil during cooler months and germinate as soon as they get favourable temperature and moisture conditions during the *kharif* season *e.g.* *Echinochloa colomum* (water grass/Jhanda), *Euphorbia hirta* (Badi dudhi) *etc.*
 - ii. **Winter annuals (*rabi season*):** Winter annuals are the weeds which grow during winter season and produce seeds during spring or summer season *e.g.* *Phalaris minor* (Canary grass/Guli-danda), *Vicia sativa* (Common vetch/RoriRewari) *etc.*
 - b) **Biennial weeds:** Those weeds that grow in the first season and complete their life cycle in the following season are referred as biennials. In general, during first year, plants grow vegetatively and reproduce or form seed in the second year *e.g.* wild carrot (*Daucus carota*) *etc.* These weeds are difficult to control by removing aerial parts as the roots have the tendency to regenerate.
 - c) **Perennial weeds:** Those weed plants that live for more than two years. These are very well adapted to withstand adverse conditions. These weeds grow not only by seeds but also by underground stem and root suckers. These are difficult to control without consistent efforts. The weeds are further classified into herbaceous (without woody tissues) and woody perennials.
 - i. **Herbaceous perennials:** They propagate through seed or vegetative parts. The vegetative parts are cut during various intercultural operations and thus get spread in the field and give rise to new weed plants. Examples are roots (*Convolvulus arvensis*) or crown (*Timothy spp.*) or bulb (*Alliums spp.*) or rhizome (*Sorghum halepense*) or tubers (*Cyperus spp.*) or seeds (*sonchus arvensis*).

ii. Woody perennials: They are generally shrubs and bushes. Some common examples are *Lantana camara*, *Eupatorium adenophorum*, *Cannabis sativa* etc.

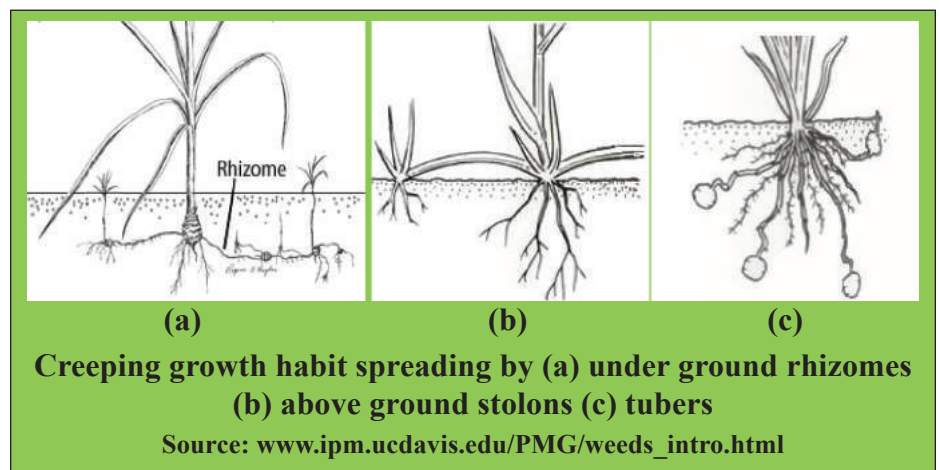
2. **Based on morphology:** It is the most widely used classification. The weeds are classified into three categories namely,

a) **Broad leaved weeds:** This is the major group of weeds and all dicotyledonous weeds are included in this category. Weeds have wide leaves and the veins branch out in different directions e.g. *Euphorbia hirta* (*Badi dudhi*).

b) **Grasses:** Grasses have narrow leaves and are arranged in sets of two with round or flat stems. All the weeds belong to family Graminae are included in this category e.g. *Echinochloa colomum* (water grass/Jhanda).



c) **Sedges:** They have plants with narrow leaves arranged in sets of three and stems are triangular in cross section. They resemble grasses and often grow in thick clusters. Sedges have a fibrous root system and may spread by under ground rhizomes



and/or above ground stolons. Many sedges have tubers from which new plants can emerge. The weeds belong to family Cyperaceae come under this group e.g. *Cyperus* spp.

Exercise 13.1: Identification of weed plants and recording of observations

Requirement: Fresh samples of weeds

Procedure: Observe different parts of the weed plant and record the observations in the data sheet on different characters such as root system (tap, fibrous), stem (herbaceous, woody), morphology *etc.* Based on these, identify the most prominent character along with name of the weed (Common/English/Botanical name).

S. No.	Local name	Botanical name	Crop in which growing	Season (<i>kharif/rabi</i>)	Root system (tap/fibrous)	Stem (herbaceous/woody)	Life cycle (annual, biennial, perennial)	Morphology (grass, broad leaved, sedge)	Any other information
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									

Exercise 13.2: Preparation of herbarium of different weed plants growing in vegetable gardens

OBJECTIVE:

- Preparation of herbarium of different weed plants for their identification during off-season

Delivery schedule: 01 period

Student's expectations/learning objective:

- How to collect weed specimen for preparation of herbarium?
- Demonstration of steps to be followed in the preparation of herbarium.

Handouts/material/equipment's and tools required: Blotting paper sheets/old newspapers, herbarium press, secateurs, scalpel, herbarium sheet, cello tape, pencil.

Introduction:

Herbarium is a collection of plants that are dried, pressed and preserved on herbarium sheets and arranged in sequence in accordance of specific purpose for future reference, record and study. Weed plants can be preserved in their original form after drying them in herbarium press. These pressed plants can be used for their identification during off-season.

Procedure/methodology:

Herbarium collection

- Collect fresh weed plants at appropriate stage with roots, leaves, flowers and seed.
- It is desirable to maintain the plant specimen in good condition.

Herbarium pressing and drying

- The wooden press board consists of two wooden plates of 12"×13" each which tighten with screws for pressing.
- Arrange the weed plant parts in normal position on a blotting paper/newspaper sheet and also turn one or two leaves of this plant showing back surface.
- The specimen in newspaper folds are to be arranged on the lower part of the pressing board. Write information about the habitat, date of collection *etc.*



Herbarium press

- Put these blotting paper sheets in herbarium press and place upper plate on the top and tighten with screws.
- Keep the specimen for 24 hrs for sweating of moisture. This is called as sweating period.
- Ensure that the specimen is spread in the newspaper folds and if necessary the top portion should be bent during pressing.
- The large specimens are to be cut in 2 to 3 parts according to convenience. The cut parts are to be arranged on separate sheets.
- The newspaper/blotting papers are changed after 12 hrs in first instance and there after 24 hrs, 48 hrs and 72 hrs till the specimens are dried completely. This is called natural drying.
- In artificial drying, after sweating period specimens are kept in hot air oven by maintaining 62°C.



Herbarium mountings

- Thick herbarium sheets of 11½” × 16½” are used for mounting.
- Keep the specimen in centre and spread properly.
- Fix the specimen to the mounting sheet with cello tape.

Herbarium labeling

- Label the specimen in the space provided 4½” × 3½” on lower right side of the herbarium sheets.
- The label information should have details of local name, common name, botanical name, habitat, collection date, collected by, and notes if any.
- Arrange the herbarium by group into *kharif* and *rabi* weeds.
- Number the herbarium sheets serially on the top right corner of the sheet and write the index for it.