

JOB ROLE – FLORICULTURIST (OPEN CULTIVATION)

Sector – Agriculture

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PPT's for Class XI



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UNIT 6: INSECT PESTS, DISEASES AND WEED MAAGEMENT

Session 3: Weed Management

Content

Title	Slide No.
Session Objectives	4
Introduction	5
Common Weeds of Ornamental Flowers	6-9
Integrated Weed Management	10-17
Herbicides	18-21
Summary	22

Session Objectives

The student will be able to :

- Identify common weeds of ornamental flowers.
- Describe integrated weed management.
- Describe herbicides.

Introduction

An undesirable plant in the field that is responsible for economic losses to the human is called weed.

Weeds may be categorised as annual, biennial or perennial, according to their life cycle. They can be reproduced by seeds or through vegetative means. Weeds are harmful as these compete with the main crop for nutrients, water, light and space, and badly affect the growth and production of the main crop.

Common Weeds of Ornamental Flower

Weeds can be classified based on cotyledon and life span.

Based on cotyledon number

Monocot weeds: The stem is hollow and round, internodes are short and hard, and the leaves are slender, long and have parallel veins. Most of the grasses belong to this group., e.g., yellow watercrown grass (*Panicum flavidum*), awnless barnyard grass (*Echinochloa colona*).

Dicot weeds: It has taproot system with broad leaves. Veins on leaves are netted and these produce flowers, e.g., blue rattlepod (*Crotalaria verucosa*), bathua (*Chenopodium album*).

Common Weeds of Ornamental Flower

Based on life span

Annual weeds: Kankawa (*Commelina benghalensis*), bathua (*Chenopodium album*), hazardana (*Phyllanthus niruri*), biskhapara (*Boerhavia diffusa*)



Bathua



Biskhapara



Kankawa

Common Weeds of Ornamental Flower

Based on life span

Biennial weeds:

Wild onion (*Allium spp.*), joy weed (*Alternanthera spp.*)

Common Weeds of Ornamental Flower

Based on life span

Perennial weeds: Yellow nut sedge (*Cyperus spp.*), Doob grass (*Cyndon dactylon*), Johnson grass (*Sorghum halepense*), Congress grass (*Parhenium spp.*), etc.



***Cypres spp.* (Motha)**



Johnson grass

Integrated Weed Management (IWM)

IWM involves the utilisation of both preventive and curative measures in a planned way. A combination of exclusion, physical, cultural, chemical and biological methods of weed control is adopted in sequence to bring down the number of weeds below a significant level.

Integrated Weed Management (IWM)

Preventive method

To avoid introduction and spread of weeds in new locality is known as preventive method of weed control. Spreading of weeds can be avoided by taking the following measures:

- Care in transplanting of seedlings
- Removal of weeds along irrigation channels and bunds
- Sowing of weed-free clean seeds
- Use of clean implements
- Use of well-decomposed manures
- Use of pre-emergence herbicide

Integrated Weed Management (IWM)

Curative method

Eradication of weeds

Complete destruction of weeds from the field is known as eradication. This may be possible only in a small area. This method is, generally, used in high value areas, such as greenhouses, ornamental plant beds and containers. In large areas, it is not possible because some seeds may have very long viability.

Integrated Weed Management (IWM)

Control of weeds

Weed control refers to minimising the infestation of weeds so that the crop can be cultivated successfully. The various methods of controlling weeds are as follows:

Mechanical and physical methods

Mowing the weed: It consists of superficial trimming of succulent and herbaceous weeds. This inhibits the formation of seeds on weeds. Mowing is practised to keep the growth of weeds under check, specially in lawns.

Hoeing: This practice is effective in controlling weeds in row crops. It has been a widely used weeding tool for centuries.

Integrated Weed Management (IWM)

Mechanical and physical methods

Mulching the field: It is a practice of covering the open soil in between the rows and plants of the crop. The soil is covered by organic matter, crop residues, polythene or paper. Cover with mulch inhibits sunlight to the exposed areas between the crops. Due to darkness, the weeds are unable to germinate.

Hand weeding: It is effective against annual and biennial weeds. Hand weeding is done by pulling out weeds from the field with the help of a *khurpi*. This facilitates the loosening of soil and improves its drainage and aeration.

Integrated Weed Management (IWM)

Cultural methods

Crop rotation: Crop rotation helps to break the life cycle of weed and prevent any weed species to dominate.

Intercropping: It suppresses the weeds better than the mono cropping system. It gives advantages to utilise crops themselves as tools for weed management.

Transplanting: Healthy and disease-free 4–6 week old seedlings should be transplanted. They have the ability to compete with weeds.

Integrated Weed Management (IWM)

Cultural methods

Soil solarization: It is the method of increasing soil temperature through absorption of sunlight, so that it destroys the seeds and other propagules of weeds. Solarisation is done by covering the soil with black polythene during extreme summer for 4 to 6 weeks.

Biological method

Living organisms, such as fungi, bacteria and insects are used to control the weed population. Such herbicides are broadly known as 'bio-herbicides'. When fungal spores or fungi are used to control weeds this is known as myco-herbicide, i.e., *Phytophthora sp.*, *Colletotrichum sp.* and *Bipolaris sp.* are in use as myco-herbicides.

Integrated Weed Management (IWM)

Biological methods

The larvae of the moth (*Crocidosema lantana*) control the *Lantana camara* plant, which bores into the flower, stems, eat flowers and fruits. *Cuscuta spp.* is controlled by *Melanagromyza cuscudae*, and *Cyperus rotundus* is controlled by moth borer (*Bactra verutana*).

Chemical control

As labour being uneconomical, one resorts to intensified use of chemicals in controlling weeds in ornamentals, which is economical. A wide range of pre-emergence, post-emergence, selective and non-selective herbicides are commonly used to control weeds.

Herbicides

These are organic chemicals which are used in a crop field or elsewhere to control weeds. Herbicides are of two types.

Selective herbicides: These herbicides are used against specific group of weeds and do not prove harmful for other crops. Pendulum, Surflan, Treflan, etc., 2, 4, 5-T, 2, 4-D, etc. kill broad-leaved weeds but do not harm monocots, while Fusilade (fluazifop) controls monocot weeds and not broad-leaved plants.

Non-selective herbicides: These are the herbicides that prove lethal to almost all monocots and dicots that come in its contact, e.g., diquat, glyphosate.

Herbicides

Classification of herbicides:

Herbicides are classified based on the time of application

Pre-plant herbicides: This is a group of herbicides may be fumigants or non-selective chemicals that is applied before planting the main crop such as Dazomet, Diquat, Glyphosate, K-pam, metam sodium, pelargonic acid, etc.

Pre-emergence herbicides: These are applied to the soil immediately after sowing the seeds before crop emergence. These herbicides are of selective type, i.e., safest for the crop. Flumioxazin, Isoxaben, Napropamide, Oryzalin (Surflan), Oxadiazon, oxyfluorfen, Pendimethalin, Prodiamine and Trifluralin are included in this group.

Herbicides

Post-emergence herbicides: These herbicides are applied when weeds and crops have emerged, usually two to three weeks after emergence. These are selective herbicides and used for a narrow range of weeds.

Broad-leaved weeds can be controlled through herbicides containing phenoxy group, e.g., 2, 4-D. Non-selective herbicides are those containing Glufosinate, Diquat, Glyphosate and Pelargonic acid, and plant oils, such as eugenol.

Herbicides

Application of herbicides:

Method of application is as important as the selection of proper herbicide. Different equipment is used for the application of herbicides according to formulation and area to be covered. On small holdings or in greenhouses, it can be applied through back pack hand pump sprayer. In big fields or farms, tractor unit may be more desirable. Over-the-top type sprayer is appropriate for commercial nurseries. To get the most uniform distribution of pre-emergence liquid herbicidal formulations, flat fan nozzles evenly spaced on a boom can be used. Hollow or cone nozzles on a boom is used in case of spraying post-emergence herbicides on weeds. Granular herbicides can be applied through common types of spreaders.

Summary

In this session you have learnt about the common weeds of ornamental flowers, integrated weed management, classification of herbicides and its application.

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