

Ministry of Higher Education  
Salahaddin University  
College of Agricultural Engineering Sciences  
Plant Protection Department



Introduction to Weeds and Weed Control  
Fourth Grade  
Spring Semester (2023-2024)  
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**Lecture 1**

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## Definition of a Weed

- A **weed** is a plant which interferes with human activity or welfare.
- It is also defined as plant growing in a place where it is not desired at a particular point in time.



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## Origin and Evolution of Weeds

- In a stable (climax) vegetation, all plant species are equally naturally adapted.

### Weeds evolved

- (i) when the stable environment is disturbed through human activities.
- (ii) from ecotypes that have evolved from wild colonizers in response to continuous habitat disturbances.
- (iii) as a result of the products of hybridization between wild domestic races of crop plants.

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## Effects of cropping activities and their effects on biodiversity



### Practices that Increases Biodiversity:

- Intercropping
- Crop rotation
- Cover cropping and Strip cropping



### Decrease in Biodiversity can be caused by:

- Monocropping
- Tillage and Herbicides use

Biodiversity leads to more stability for the **ecosystem**.

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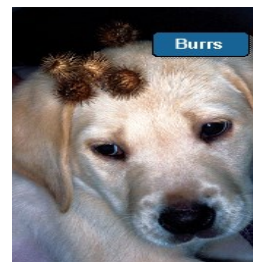


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## Characteristics of Weeds

- Harmful to humans, animal and crops
- Wild and rank growth in an environment
- Exhibits persistency
- High reproductive capacity: large number of seeds, possess different types of seeds, tubers , rhizomes.
- Seed Dormancy : could be innate, induced or enforced.



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## Characteristics of Weeds

- Usually present in large populations..
- Could be regarded as being useless, unwanted and undesirable
- They exhibit spontaneous appearance without being planted
- Many weeds are aggressive and have rapid seedling growth



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## Economic Importance of Weed Control



### Reduction in crop yield through:

Physical Interaction (Allelopathy: competition for growth resources including water, light, nutrient, air, space.

### Chemical interaction (Allelopathy)

Any direct or indirect **harmful** or **beneficial** effect of one plant or a microorganism on other plants by releasing chemicals termed allelochemicals to the environment.

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## Economic Importance of Weed Control



### ☐ Reduction in crop quality through

- direct contamination of cultivated rice and maize grain by **wild rice** and **itch grass**
- reduction in Sugarcane juice quality by the presence of sida.
- contamination of cotton lint by dried weed fragments



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## Economic Importance of Weed Control



- ☐ Interference with field operations (harvest, pesticide, etc.)
- ☐ Some are poisonous to grazing animals e.g. *Euphorbia heterophylla*, *Halogeton glomeratus* contain high **oxalate** content, it can kill **livestock** when eaten in dry season.

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## Economic Importance of Weed Control



- Some are harmful to **grazing** animals e.g. *Amaranthus spinosus* increase cost of production; high cost of labour and equipment during harvesting.
- Presence of weeds can impede water flow in irrigation canals
- Weeds present in lakes and reservoirs can increase loss of water by evapotranspiration



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## Economic Importance of Weed Control



- Reduction in quality of animal products: hay, silage etc. protein content in alfalfa wild garlic (*Alliums spp*) when eaten by cattle spoils the meat and the milk.
- Serve as alternate hosts for many plant diseases and animal pests e.g. insects, rodents, birds. *Cyperus rotundus* serve as alternate to nematodes
- Can serve as sources of fire hazards.

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## Beneficial Effects of Weeds

- Reduce erosion problem through the production of protective cover
- Help in nutrient recycling through decay of vegetative part.
- Food/vegetables for humans e.g. leaves of *Talinum triangulare*, and tubers of *Colocasia esculentus*.
- Serve as hosts and nectar for beneficial insects
- Beautification of the landscape e.g. *Cynodon dactylon*



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## Beneficial Effects of Weeds

- Feed for livestock and wildlife and aquatic organisms in form of hay, silage and forage / pasture and branches and whole plant.
- Source of genetic material for useful traits in crop improvement.
- Medicinal use e.g. neem (*Azadirachta indica*), *Ageratum conyzoides*



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## Beneficial Effects of Weeds

- Habitat for wildlife and plant species hence biodiversity conservation.
- Major role in carbon recycling through carbon sequestration.
- Field of exposed soil always suffers a net loss in organic matter and releases carbon dioxide, while a field covered with crops and/or weeds takes up carbon dioxide.