

Weed and its management: An overview

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Introduction

Weed is a plant growing out of place and out of time. In elaborate, weed is a plant growing in place and time when we want to grow some other plants or no plants to grow at all. In worldwide about 30,000 plant species have been identified as definite weed out of it 18,000 cause serious loss to crops.

What are all the problems caused by weeds?

(i) In Agriculture:

Weeds are the major biotic constraint to reduce crop productivity worldwide. Weeds deplete the crop environment by competing with nutrients, space, water and light. This competition leads to a reduction in crop yield considerably. Weeds are not only reduced the yield of crops but also cause inconvenience by interfering with agricultural operations. Weeds present in the offseason on field bunds, wastelands and irrigation channels act as a harbour for pests and diseases. Contamination of food grains with weed seeds is harmful to human health and reduces crop quality. According to the Directorate of Weed Research, Jabalpur, losses caused by weeds in agriculture are estimated to be 33%, followed by insects (26%) and diseases (20%) in India, 2016. A recent estimate shows that weed causes an annual loss of rupees 2000 crores to Indian agriculture, which is more than the combined losses caused by insect pests and plant pathogens. Yield losses caused by weeds in different crops were furnished in Table 1.

(ii) In Animal Husbandry:

Forage crops often grown along with weeds shows reduced nutrient content due to the competition with weeds. Intake of weedy forage leads to produce odd flavour in milk and meat. Certain weeds cause sickness in the animal while others may create fatal due to high levels of specific alkaloids, tannins, oxalates, glucosides and nitrates. Problems caused by weeds in animal husbandry are presented in Table 2.

(iii) In Human Health:

Weeds provide food, protection and habitat for the reproduction of vectors of fatal human diseases. Health, comfort and work efficiency of human is adversely affected by weeds. Health problems caused by weeds to humans are furnished in Table 3.

| Crop | Yield loss (%) | Crop | Yield loss (%) |
|---------------|----------------|------------|----------------|
| Rice | 41.6 | Pea | 10 - 50 |
| Wheat | 10 - 60 | Pigeon pea | 20 - 30 |
| Maize | 30 - 40 | Soybean | 30.5 |
| Sorghum | 45 - 69 | Niger | 20 - 30 |
| Pearl millet | 16 - 65 | Groundnut | 30 - 80 |
| Finger millet | 50 | Vegetable | 30 - 40 |
| Horse gram | 30 | Jute | 30 - 70 |
| Green gram | 10 - 45 | Cotton | 40 - 60 |
| Lentil | 30 - 35 | Sugarcane | 25 - 50 |
| Chickpea | 10 - 50 | Potato | 20 - 30 |

Table 1: Yield losses caused by weeds in different crops.

(iv) In Aquatic Ecosystem:

Not only in the land, but weeds are also a nuisance in and around the water bodies. Aquatic weeds make the appearance of waterbodies repulsive and decline their recreational value. Aquatic weeds in waterbodies hinder navigation and fishing. The occurrence of weed in irrigation channels leads to hinder the water flow as well as disperse the weed seed into other nearby crop fields.

(v) In Forest Ecosystem:

In a forest, dry weeds offer a potential source of fire hazards. A weed like *Lantana camara* can catch fire even when it's green. The presence of unwanted brushes reduces tree growth and prevents recreational value. In extreme cases brush weed take over the forest land from young forest trees.

(vi) In Aesthetics:

In advanced countries lowering the aesthetic value is the primary objection to weeds. Weeds present around the working and living places makes the surrounding dull and insipid.

| S. No | Weed | Problem caused in animals |
|-------|---|---|
| 1. | Leaves of <i>Lantana camara</i> | Induce acute photosensitivity and jaundice in animals due to their toxic principle ' Lantradene A '. |
| 2. | Carrot grass (<i>Parthenium hysterophorus</i>) | Cause dermatitis in livestock. |
| 3. | Locoweeds (<i>Astragalus</i> and <i>Oxytropis</i> species) | Inflict abortive and teratogenesis effect on sheep and cattle due to their toxic alkaloid ' Swainsonine '. |
| 4. | <i>Lupinus sericeus</i> | Induces crooked calf disease in cattle. |
| 5. | <i>Rhododentron</i> species | Causing diarrhea in milch animals. |
| 6. | Sweet clover (<i>Melilotus alba</i>) | Contains Dicumarin , which acts as an anti blood coagulant. |
| 7. | <i>Chenopodium album</i> , <i>Amaranthus viridis</i> , <i>Cirsium arvense</i> , <i>polygonum</i> species | Under drought condition which causes Asphyxia in animals due to develop high nitrate level (1000 ppm) |
| 8. | <i>Tribullu terrestris</i> | Spines can puncture animal skin. |
| 9. | <i>Sturmarium species</i> | Impairing the quality of wool. |
| 10. | <i>Sorghum halepense</i> at tillering stage | Poisonous to animals due to high prussic acid contents. |

Table 2: Problem caused by weeds in animal husbandry

How to manage the weeds?

Weed management is an important agro-technique for successful crop cultivation. Weed free condition during the critical period is absolutely important for getting maximum yield. Weeds can be effectively managed by cultural (Tillage, planting method, varieties, planting density, irrigation, fertilizer application, drainage and cropping system), physical (Hand weeding, hand hoeing, digging, mowing, cutting, dredging, chaining, burning and flaming),



chemical and biological methods. All those methods of weed control have their advantage and disadvantages.

Recent constraint in weed management

Among all those methods, hand weeding is an effective method of weed management. During hand weeding, all the weeds including the weeds associated with a particular crop and the weed that resembles the crop (Mimicry weed) also removed efficiently. At the same time, increasing laborer cost and scarcity of laborer during the critical period of agricultural operation lead to the search for alternative methods.

Solution

In this above context, the chemical method of weed management is the most effective, economical way of weed management. Herbicide offers effective weed control before crop planting as a pre plant herbicide, after crop planting and before weed emergence as a pre emergence herbicide and after weed emergence in a standing crop as a post emergence herbicide. While choosing an herbicide for successful weed management, we remember to maintain the environmental and ecological balance. The environmental and ecological balance is maintained by using low dose, low residual and high efficiency herbicide. Apart from this, herbicidal weed management saves time, energy and cost of weeding. Some important herbicides used for weed control in different crops are given in Table 4.

Reference

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