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Integrated Weed Management and Post- Emergence Strategies for Plants in Fields

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ABSTRACT

Weeds have a negative impact on agriculture, the ecology, and the value of property. They threaten crops and the environment when personnel, equipment, and ideal environmental conditions are few. They have produced several issues for the environment and plants. A variety of interdisciplinary tactics, such as physical, cultural, chemical, and biological approaches, are used in integrated weed management. These methods are crucial for managing weeds that threaten crops, the environment, and plants when personnel and equipment are few, which encourages a variety of techniques. This paper reviews the different methods used to manage weed growth.

Keywords; Environment, Control, Management, Competition.

Comprehensive Weed Management

Weeds are undesired, destructive plants that survive and flourish alongside commercial crops, reducing productivity. For several reasons, including social, economic, and aesthetic value, weeds must be removed. Weed-related looseness is more common than insect infestation in fields. Weeds typically lower output by 25–30%. Controlling weeds is crucial for sustainability, thus farmers employ a variety of techniques, which encourages integrated weed management. A collection of interdisciplinary tactics known as physical, cultural, chemical, and biological approaches are used in integrated weed management. These methods are crucial for managing weeds that threaten crops and the environment when personnel, equipment, and ideal environmental conditions are few.

What Makes IWM Important:

Weed management is essential since they have produced several issues for the environment and plants. Weeds have a detrimental effect on agriculture, the ecology, and the value of property. They have also created numerous problems on highways, trains, and airports. Since most grasses serve as an alternate home for the brown leaf-hopper, certain weeds in fields attract a lot of pests that spread a lot of illnesses. Weeds disrupt crops' ability to calculate water, nutrients, space, light, and other factors. Weeds can interfere with farm equipment and make some farming operations challenging. Weeds provide a significant obstacle to irrigation because they impede water channels, some of which are deadly to farm animals, and they raise farmers' input costs, which in turn lower their profitability.

Some IWM characteristics

Include minimizing the detrimental effects on the environment and agricultural output. Some IWM characteristics listed below the target weeds from various management vantage points include chemical, cultural, biological, etc.

Many strategies, including as crop rotation and cover crops, are used to manage weed growth. rotation of several herbicides in accordance with their modes of action to prevent weed resistance. Use biological organisms like insects to control weeds. Some cultural practices help manage weeds, such as adjusting plant density, row-to-row spacing, and sowing timing. As far as possible, we should use less chemicals to prevent environmental pollution and weed resistance [1].

Cultural Approach:

It is a method of weed management that involves altering the land from planting to harvesting, such as through crop rotation, without using chemicals.

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Cultural weed management is a method of weed control that involves altering the land from planting to harvesting, such as through crop rotation, without employing any chemical or biological agents. Fields should be set up such that crops have an advantage over weeds in the competition. Crop rotation is a strategy in which the pattern of the crop is changed. For example, some weeds have a relationship with the crop and the season when the pattern is changed, causing the weeds linked with the crop to disappear during that season.

Changing the timing of crop planting is also useful because if we postpone sowing, most weeds will already have grown by the time we do. When we eliminate the weeds before planting our crops, the crops develop first and get an advantage, favoring them in the competition.

The greatest agronomic approaches for managing weed density and population are cultural weed management. Crop rotation, mulching, planting patterns, plan density, weed-free seed, and tillage are a few cultural techniques.

The best weed management strategy is cropping rotation. When crops are rotated, there is no room for weeds since the second crop covers the excess area, preventing any chance of weeds emerging. Also, note that in crop rotation, one crop must be restorative and not both must be exhausting due to competition or yield effects.

The greatest method for weed management is mulching. organic or synthetic When we remove the weeds before planting our crops, the crop will grow first and take the lead, favoring yield in the process.

When organic or artificial mulch is applied to a field, the weeds are suppressed, and the soil moisture is preserved. Because some weeds require light to germinate, when mulch is applied the surface is covered, preventing light from penetrating, and the weeds die or go into dormancy.

sowing method is an important consideration, planting pattern and density are also wise strategies. Crops sown in a drill or on a line can help control weeds for improved weed management. During transmitting Mulch can be organic or synthetic. In broadcasting, the plant population is not evenly distributed, and there is also an irregular amount of space between the plants. This disruption leads to uneven plant populations, which can sometimes be dominated by weeds.

choosing the finest types with the greatest capacity to absorb nutrients from the soil and the potential for rapid growth can outnumber the weed population Using cover crops on shared property is an effective weed control strategy. The planting of cover crops is beneficial in many ways, including improving soil fertility and reducing weed growth. It also reduces erosion and absorbs atmospheric carbon dioxide, which is a key factor in climate change.

Preventive measures

The most crucial element in integrated weed management is preventative control, in which we work to keep weeds from entering our field in the first place. We use a variety of techniques to keep weeds out of our land. We don't utilize crop seeds, compost, or manure that has weed seeds in it. We don't utilize used machinery before cleaning since the majority of the seeds are connected to them, as on tractors, but when they reach our fields, they are a significant source of weed seed dissemination. Because our field has a large number of weeds, we need to clear the water routes and the non-crop area [2].

Mechanical weeds;

Mechanical weed management, often known as physical weed control, is a method in which we physically remove weeds or disrupt their life cycle using a variety of methods, such as. removing weeds from a field by manual hoeing (using equipment such as a kasola or khurpa). removing the weeds by tillage (this involves using tools like harrows, weeders, and cultivators that cover more ground quickly and are economically feasible). Mowing (which may be used to efficiently reduce weed growth in lawns, parking lots, roadside vegetation, and playgrounds) is one method of removing them.

Mechanical weed management is typically more efficient, economically feasible, and has a great coverage capacity. Some crops are unique. Mechanical weed management, often known as physical weed control, is a method of eliminating weeds or interrupting their life cycle. The growth of some crops, in particular broadcaster crops and uprooted crops, is reduced, which is why mechanical techniques are only practical for crops that were planted in straight rows. Mechanical operations can occasionally disrupt soil and leave it vulnerable to erosion [3].

Biological Weeds Control

In order to control the number of weeds in our field, we can utilize live creatures such as insects, fungus, and bacteria that target weeds rather than crops. For instance, a leaf-eating insect called a carysolina gamelan was introduced years ago to reduce Klamath weed. There are several biological

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agents that are used to control weeds, however some of these agents are poisonous to both crops and weeds while others are just hazardous to weeds. From an environmental standpoint, biological weed management is a desirable strategy.

The biological agents employed to control weeds include characteristics such as host specificity, which kills just target crops without harming major crops, and fast growth, which indicates that these agents reproduce quickly. survive under extreme weather circumstances, cheap cost of purchase indicates affordable for normal farmers to buy and use in the field, and eco-friendly refers to a biological agent that is kind to the environment. It takes a long time to identify a selective natural enemy and reach a certain degree of precision to control a specific weed, and a long study is needed to ensure that the biological agent is environmental specific and cannot be successful everywhere. It is also difficult to adopt biological approaches everywhere because they have not been successful with crops.

Chemical weeds control

Herbicides and pesticides are substances that either kill or prevent the growth of weeds or undesirable plants. No matter the kind of substance, organic or artificial, our major goal is to minimize weed growth and maximize production. Sulfuric acid, sodium chloride, sodium chlorate, and ashes are some common weed killers that are not well known for being production. Sulfuric is a common organic pesticide that is used to control weeds in sugarcane, cotton, and cereal production. Sulfuric (paraquat) was the first herbicide to be registered in Pakistan in 1972.

Herbicides must be applied at the right time for them to be effective, either before or after plant emergence. . Pre-emergence herbicides are incorporated into the soil before to crop growth, while post-emergence herbicides are applied after seedling establishment. Herbicides can be used for spot treatment, band placement, and broadcast. Commonly used hand-operated sprayers administer doses of liquid formulation directly to weeds or soil. In the modern technology, remote-controlled tiny planes are employed to spray a big area quickly.

Classification of Herbicides

Herbicides are primarily categorized according to their chemical makeup, timing, basis for application, method of application, and mode of action. Herbicides are generally split into two categories: organic and inorganic. All current herbicides are organic, breaking down into carbon dioxide, water, sulphate, and chlorine, among other things. Inorganic herbicides, on the other hand, are frequently used as general weedicides, such as sodium chloride, ashes, and sodium chlorate. However, only sodium chlorate is still used for this purpose due to its high toxicity. Selective and non-selective herbicides are the two types of herbicides classified according to selectivity. As with Atrazine simazine, selective herbicides destroy only the target plant without harming adjacent crops. On-selective herbicides, like Glyfosate, have an adverse effect on all plants in contact. Herbicides on translocation fall into two categories: contact and systematic. Systematic herbicides, like Atrazine, migrate throughout the plant's body by moving through the xylem and phloem, whereas contact herbicides, like paraquat, only destroy the parts that come into direct touch—application-based herbicides for use before, during, and after the emergence of plants. Flutolanil is an herbicide used before planting crops in fields. Pre-emergence herbicides are used before weeds appear, while post-emergence herbicides are used after weeds emerge.

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Herbicides	Common Name	Crop	Dose /Acre
Ordram 8E	Molinate	Rice	800 cc
Dropp	Thidiazuron	Cotton	120 g
Dosanex 80WP	Metoxuron	Wheat	650 g
Preflan 80WP	Tebuthiron	Sugarcane	800 cc

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