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"STUDY OF TRADITIONAL METHOD OF WEEDING AND FERTILIZING AND THEIR DRAWBACKS"

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Abstract – *India has a wide range of agro climates and soil types. The highly diverse agriculture and fanning systems are beset with different types of weed problems. Weeds cause 10-80% crop yield losses besides impairing product quality and causing health and environmental hazards. Invasive alien weeds are a major constraint to agriculture, forestry and aquatic environment. Crop-specific problematic weeds (weedy rice in rice) are emerging as a threat to cultivation, affecting crop production, quality of product and income of farmers. Traditionally, weed control in India has been. Largely dependent on manual weeding. However, increased labour scarcity and costs are encouraging farmers to adopt labour and cost-saving options. These include herbicides whose market grew at an annual rate of 15%. Integrated weed management (IWM) is being practiced by Indian farmers, with the level of adoption varying from one farm to the other. The continuous application of isoproturon coupled with mono-cropping rotation of rice-wheat has led to the evolution of resistance in Palmaris minor Retz. In the northern part of India, Efforts to manage herbicide resistance have led to the adoption of conservation agriculture in the rice-wheat cropping system, as a component of IWM. Research on weed management in India is mostly centered on herbicide efficacy. Herbicides, applied alone or in combinations, have been regarded as essential tools in the effective management of weeds in different-ecosystems.*

Key Words: *Weeds, Environmental, Agriculture*

1. INTRODUCTION

The noxious incidence of undesirable plants, also known as weeds, is one of the major constraints to world agricultural production. Weeds are plants that under certain conditions cause economic and social harm to the farmers. In the agro-ecological context, weeds are a product of the inter-specific selection brought about by humans since they began cropping, which affected the soil and the whole habitat. The process of selection is continuous and depends on the practices adopted by the farmer. The present use of chemical herbicides has caused important changes of weed flora in cropping areas, including those of prevailing species as well as biotypes of other species becoming resistant to the commonly used chemical herbicides.

The damage caused by weeds is seen in various ways and seriously affects various agricultural processes. Weeds cause problems due to: – competition with crops for nutrients, water and light; – the release of root exudates and foliar lactates toxic to crops; – the creation of a favorable habitat for the proliferation of other pests (arthropods, mites, pathogens and others), serving as hosts for them; – interference with the normal harvesting process and contamination of produce.

Losses caused by weeds may be from 5 to 10 percent in the agriculture of developed countries, while losses can be up to 20 to 30 percent in developing or emerging countries, i.e. those that depend to a greater extent economically on their agricultural production.

Traditional knowledge has been passed on to subsequent generation through oral means. There are no/limited accounted versions of this knowledge, which can be preserved for future reference and dissemination. The source of this knowledge base is the older generation and

there is an imminent requirement to document this before they fade away. Traditional information on health, animal health, livestock management, food, agriculture, timber, dye, religious ceremonies etc. can be put into the best use for future generations through documenting. Projects associated with conservation of biological diversity, sustainable uses of natural resources, indigenous health practices etc. will be benefitted as important aspects can be used for their proper implementation. It also increases the awareness of the younger generations towards the traditional knowledge.

The pertaining to agriculture remains a fairly unexplored field, with many information being undocumented. By identifying, documenting and incorporating some of these practices, the information that is available in this field can be put into best use. Most of these practices involve lower cost and hence may benefit the national economy too. Through the current study, an attempt has been made to document some of these practices related to agriculture for the future benefit of the mankind.

A plant which is undesired in a particular context is called a weed. Weed control is a process in which growth of such plants are checked or controlled to reduce its competition with the desired flora of a place. Several methods including chemical methods are used by farmers to get rid of the weeds. But, chemical methods of weed control have their baggage of issues like affecting the growth of desirable plants and accumulation of the chemical residues, causing harm to the consumers. Hence traditional methods of weed control are increasingly becoming important. In this study, we have documented the prevalence of traditional weed control measures taken by farmers in the study locale. A large chunk of agricultural crops succumb annually to attacks by different insects, pests and diseases during cultivation, harvesting and storage. In order to minimize these losses, several pest and disease management techniques involving various biological and chemical agents are being adopted by different farmers. Through the usage of pesticides, the farmers have been able to increase their agricultural productivity to a large extent. However, as with chemical methods described in earlier sections, excessive usage of chemical pesticides have led to serious hazards like environmental pollution, adversely affecting the health of consumers and causing death of non-target organisms.

1.1 CULTURAL WEED CONTROL

Several cultural practices like tillage, planting, fertilizer application, irrigation etc., are employed for creating favourable condition for the crop. These practices if used properly, help in controlling weeds. Cultural methods, alone cannot control weeds, but help in reducing weed population. They should, therefore, be used in combination with other methods. In cultural methods, tillage, fertilizer application. and irrigation are important. In addition, aspects like selection of variety, time of sowing, cropping system, cleanliness of the farm etc., are also useful in controlling weeds

1. Field preparation: The field has to be kept weed free. Flowering of weeds should not be allowed. This helps in prevention of build up of weed seed population.

2. Summer tillage: The practice of summer tillage or off-season tillage is one of the effective cultural methods to check the growth of perennial weed population in crop cultivation. Initial tillage before cropping should encourage clod formation. These clods, which have the weed propagates, upon drying desiccate the same. Subsequent tillage operations should break the clods into small units to further expose the shriveled weeds to the hot sun

Fig 1.1: Summer Tillage

3. Maintenance of optimum plant population: Lack of adequate plant population is prone to heavy weed infestation, which becomes, difficult to control later. Therefore practices like selection of proper seed, right method of sowing, adequate seed rate protection of seed from soil borne pests and diseases etc. are very important to obtain proper and uniform crop stand capable of offering competition to the weeds.

4. Crop rotation: The possibilities of a certain weed species or group of species occurring is greater if the same crop is grown year after year. In many instances, crop rotation can eliminate difficult weed problems. The obnoxious weeds like *Cyperusrotundus* can be controlled effectively by including low land rice in crop rotation.

5. Growing of intercrops: Inter cropping suppresses weeds better than sole cropping and thus provides an opportunity to utilize crops themselves as tools of weed management. Many short duration pulses viz., green gram and soybean effectively smother weeds without causing reduction in the yield of main crop.

6. Mulching: Mulch is a protective covering of material maintained on soil surface. Mulching has smothering effect on weed control by excluding light from the photosynthetic portions of a plant and thus inhibiting the top growth. It is very effective against annual weeds and some perennial weeds like *Cynodondactylon.* Mulching is done by dry or green crop residues, plastic sheet or polythene film. To be effective the mulch should be thick enough to prevent light

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7. Solarisation: This is another method of utilization of solar energy for the desiccation of weeds. In this method, the soil temperature is further raised by 5 – 10 ºC by covering a pre-soaked fallow field with thin transparent plastic sheet. The plastic sheet checks the long wave back radiation from the soil and prevents loss of energy by hindering moisture evaporation

8. Stale seedbed: A stale seedbed is one where initial one or two flushes of weeds are destroyed before planting of a crop. This is achieved by soaking a well prepared field with either irrigation or rain and allowing the weeds to germinate. At this stage a shallow tillage or non- residual herbicide like parquet may be used to destroy the dense flush of young weed seedlings. This may be followed immediately by sowing. This technique allows the crop to germinate in almost weed-free environment.

3.2 DRAWBACKS OF TRADITIONAL WEEDING METHODS

- Pollutes the environment.
- Affects the soil microbes if the dose exceeds.
- Herbicide causes drift effect to the adjoining field.
- It requires certain amount of minimum technical knowledge for calibration.
- Leaves residual effects.
- Some herbicide is highly costlier.
- Suitable herbicides are not available.
- Immediate and quick weed control is not possible.
- Weeds are kept under suppressed condition.
- Perennial and problematic weeds cannot be controlled.
- Practical difficulty in adoption.

3. METHODOLOGY ADOPTED FOR THE PROJECT

3.1 BROADCASTING

1. It refers to spreading fertilizers uniformly all over the field.
2. Suitable for crops with dense stand, the plant roots permeate the whole volume of the soil, large doses of fertilizers are applied and insoluble phosphatic fertilizers such as rock phosphate are used.

a) Broadcasting at sowing or planting (Basal application)

The main objectives of broadcasting the fertilizers at sowing time are to uniformly distribute the fertilizer over the entire field and to mix it with soil.

b) Top Dressing

It is the broadcasting of fertilizers particularly nitrogenous fertilizers in closely sown crops like paddy and wheat, with the objective of supplying nitrogen in readily available form to growing plants.

c) Disadvantages of Broadcasting

The main disadvantages of application of fertilizers through broadcasting are:
i) Nutrients cannot be fully utilized by plant roots as they move laterally over long distances.
ii) The weed growth is stimulated all over the field.
iii) Nutrients are fixed in the soil as they come in contact with a large mass of soil.

3.2 PLACEMENT

1. It refers to the placement of fertilizers in soil at a specific place with or without reference to the position of the seed.
2. Placement of fertilizers is normally recommended when the quantity of fertilizers to apply is small, development of the root system is poor, soil have a low level of fertility and to apply phosphatic and potassic fertilizer.

The most common methods of placement are as follows:

a) Plough sole placement

1. In this method, fertilizer is placed at the bottom of the plough furrow in a continuous band during the process of ploughing.
2. Every band is covered as the next furrow is turned.
3. This method is suitable for areas where soil becomes quite dry upto few cm below the soil surface and soils having a heavy clay pan just below the plough sole layer.

b) Deep placement

It is the placement of ammoniacal nitrogenous fertilizers in the reduction zone of soil particularly in paddy fields, where ammoniacal nitrogen remains available to the crop. This method ensures better distribution of fertilizer in the root zone soil and prevents loss of nutrients by run-off.

c) Localized placement

It refers to the application of fertilizers into the soil close to the seed or plant in order to supply the nutrients in adequate amounts to the roots of growing plants. The common methods to place fertilizers close to the seed or plant are as follows:

- **Drilling**

  In this method, the fertilizer is applied at the time of sowing by means of a seed-cum-fertilizer drill. This places fertilizer and the seed in the same

row but at different depths. Although this method has been found suitable for the application of phosphatic and potassic fertilizers in cereal crops, but sometimes germination of seeds and young plants may get damaged due to higher concentration of soluble salts.

- **Side dressing**

It refers to the spread of fertilizer in between the rows and around the plants. The common methods of side-dressing are

1. Placement of nitrogenous fertilizers by hand in between the rows of crops like maize, sugarcane, cotton etc., to apply additional doses of nitrogen to the growing crops

Placement of fertilizers around the trees like mango, apple, grapes, papaya etc

d)Band placement

If refers to the placement of fertilizer in bands. Band placement is of two types.

i) Hill placement

It is practiced for the application of fertilizers in orchards. In this method, fertilizers are placed close to the plant in bands on one or both sides of the plant. The length and depth of the band varies with the nature of the crop.

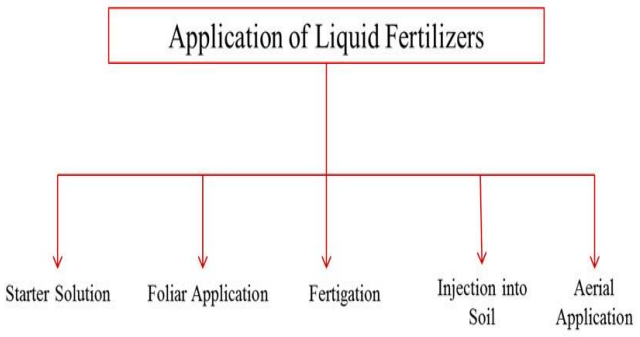
ii) Row placement

When the crops like sugarcane, potato, maize, cereals etc., are sown close together in rows, the fertilizer is applied in continuous bands on one or both sides of the row, which is known as row placement.

Fig3.1: Row Placement

3.3 PELLET APPLICATION

1. It refers to the placement of nitrogenous fertilizer in the form of pellets 2.5 to 5 cm deep between the rows of the paddy crop.
2. The fertilizer is mixed with the soil in the ratio of 1:10 and made small pellets of convenient size to deposit in the mud of paddy fields



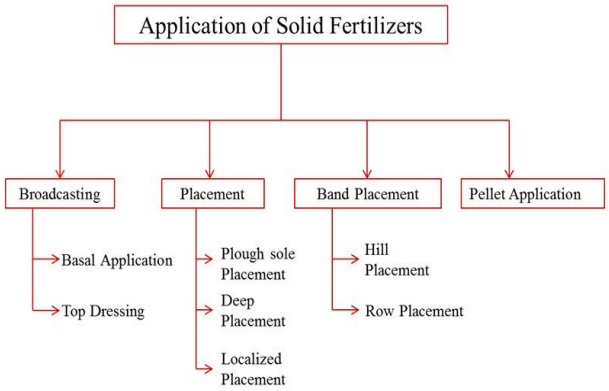


Fig 3.2: Flow Charts of Application of Fertilizers

4.4 DRAWBACKS OF CULTURAL FERTILIZING METHODS

- Global warming via release of greenhouse gases
- Mono-cultures and consequences associated with elimination of diversity
- Ever increasing dependence on chemical systems
- Nutrient pollution as evidenced by algae blooms, eutrophication
- Water quality issues, lower oxygen levels and dangers to fish stocks
- Direct impacts on human health (cancers, nutrient deficiencies, etc)

4 CONCLUSION

Thus, from the study we can conclude that the traditional methods of weeding as well as fertilizing are not as efficient as needed. Also these techniques are lot of time consuming. Also the labour required is more and also labors need more efforts to complete the weeding and fertilizing process. These traditional methods take more time and also the efficiency is less. Hence now it is a prime need to develop new modern & efficient techniques for weeding

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