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STUDY ON THE VEGETABLE PESTS OF WINTER SEASON IN SHEKHAWATI REASON OF RAJASTHANN

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ABSTRACT

Shekhawati is a region that attracts a significant number of researchers, scientists, and biologists on account of the high amount of biodiversity that can be found there. Both the plant and animal life that may be discovered in the area that is the subject of this research has adapted through time to be able to live in dry circumstances, and neither the flora nor the fauna are evenly or densely spread over the landscape. The investigation was conducted in 2010 and 2010, which is when the results on Nilgai were shown to be significant. There are a total of 120 distinct kinds of desert birds in the region, including both migratory and permanent residents. *Prosopis cineraria* (Khejri), *Azadirachta indica* (Neem), *Ficus religiosa* (Pepal), *Dalbergia sisso* (Seesam), *Acacia nilotica* (Desi Babul), *Salvadora persica* (Mitha Jal), *Albizia lebbek* (Sares), and *Prosopis juliflora* are the most notable examples of the region's (Vilayti Babul). The leaves of desert plants are often reduced to spines and thorns in order to decrease the quantity of water that is lost to evaporation.

Keywords: *vegetable pests, crop patterns*

INTRODUCTION-

Although the use of pesticides benefits humans by increasing the availability of food, these chemicals are now among the most significant causes of environmental contamination and pollution. The word "pesticide" refers to any material that is used to control anything that has been recognised as a "pest," which covers a wide variety of organisms. These compounds may be either chemical or biological in nature. Insects are without a doubt the most harmful of all pests around the world, and they are also the sort of pest that is most likely to be the most frequent (Worthing 1991). The Food and Agriculture Organization of the United Nations (FAO) has given the following definition of the term "pesticide": "any substance or mixture of substances intended for preventing, destroying, or otherwise controlling any pest, including vectors of human or animal diseases, unwanted species of plants or animals causing harm during or otherwise interfering with the production, processing, storage, transport, or marketing of food, agricultural commodities, wood and wood products or animal feedstuffs; or substances which may be

administered to animals for the purpose

India is the country that uses the most pesticides out of all the South Asian nations. It is the third greatest user of pesticides in the whole globe. According to a survey, more than fifty percent of the vegetable samples that came from India included pesticide residue, with more than sixteen percent of those samples above the acceptable standard. The Stockholm Convention on Persistent Organic Pollutants identifies pesticides as nine of the twelve organic substances that pose the greatest risk and are the most persistent. The overuse of pesticides contributes to the development of major environmental issues, such as the eradication of natural predators and the proliferation of unwanted insects and animals (TATAGAR et al., 2010). According to estimates provided by the World Health Organization and the United Nations Environment Programme, over 3 million agricultural labourers in poor countries suffer from severe pesticide poisoning each year, 18,000 of them die away as a direct result of their exposure (Miller, 2004).

Because non-target creatures contain physiologic and biochemical systems that are comparable to those of target organisms, non-target species are commonly affected by pesticides, despite the fact that pesticides are not specific. Because of this, there will be a reduction in the area's biodiversity. The natural predators of the pest, which might actually assist the farmer manage the pest, have also been eradicated along with the insect, which may result in a much greater number of pest populations over the subsequent crop season. Because of this, the farmer is forced to rely more and more on chemical ways to rid their land of pests. Because of this, the farmers are in a poor economic state, and this is accountable for it. These pesticides are expensive.

One may classify the pesticides into their respective chemical families. Organophosphate pesticides, carbamate pesticides, organochlorine insecticides, and pyrethroid pesticides are the four primary classifications of chemical pesticides that are recognised by the United States Environmental Protection Agency (EPA). The Environmental Protection Agency (EPA) of the United States of America has shown that some pesticides may cause cancer even at very low concentrations. Following contact with such a toxicant, the normal physiological processes of the body become disrupted, and the organism as a whole experiences increased levels of stress.

There are a few distinct kinds of toxicity tests that may be carried out in order to determine the amounts of the pesticide. The 96-hour toxicity test, often known as the short term or acute toxicity test, is by far the most popular test used to determine the harmful effects of pesticides. The majority of these tests are performed at high concentrations, with death serving as the endpoint LC50 values, which refer to the dosage or concentration that is fatal to fifty percent of the test population (Adams and Rowland, 2004). The concentrations that are employed in acute toxicity testing are said by some writers to be very

unrealistic and unable to be transferred to real-world settings because of this. When there is a lack of chronic data, authorities continue to heavily rely on LC50 levels to determine the "risk" posed by a chemical based on data from acute tests (Adams and Rowland, 2004; Anzecc and Armcanz, 2000). This kind of test of toxicity may be referred to as a chronic toxicity test when the acute toxicity test is continued for a month with persons who are still alive after the test. These are the most accurate and useful ways for determining the dangers posed by pesticide contamination and the implications such dangers have for the populations of insects.

According to the Environmental Protection Agency (EPA), biopesticides in the United States include naturally occurring substances to control pest populations (biochemical pesticides), microorganisms as natural enemies of pest (microbial pesticides), and pesticidal substances produced by plants. These biopesticides can be broken down into three categories: (plant-incorporated protectants). In 1985, the United States Environmental Protection Agency (EPA) granted Ex- Margosan-O® (W.R. Grace & Company of Columbia, Maryland, United States) registration as an insecticide for use in non-food crop pest management (Stark and Walter, 1995). It was the very first biopesticide available on the market that was developed from neem. One such example of a biopesticide is the fungus known as *Trichoderma viride*. Because of its naturally occurring fungicidal properties, it is effective against plant pathogenic fungi.

The term "integrated pest management," or IPM for short, refers to a technique that is considered to be the most effective form of pest control since it makes use of an optimal combination of some or all of the different approaches that are now available. It is a strategy that is kind to the environment, and it makes use of methods including cultural, mechanical, and biological approaches. It places an emphasis on the use of bio-insecticides as well as pesticides derived from plants. In addition to this, it employs the use of chemical pesticides, but only in the event that other measures are unable to maintain pest numbers at a level below the economic threshold (ETL). The primary goals are to maximise crop production while minimising input costs; to minimise environmental pollution in soil, water, and air due to pesticides; to minimise occupational health hazards due to chemical pesticides; to conserve ecosystems and maintain ecological equilibrium; and to use chemical pesticides in a judicious manner for the purpose of reducing pesticide residues. IPM's single most essential component is the use of biological methods to manage insect pests. Utilizing parasitoids, predators, and diseases on purpose is required for this method. In this context, a novel method would consist of either the introduction of a new bio agent or the enhancement of the efficiency of the pest's natural predators.

In India, like in other parts of the world, the organic agricultural approach has been practised since ancient times. The cultivation of crops in such a manner as to preserve the fertility of the soil is the goal of this practise. It is accomplished by the use of organic wastes (waste from crops, animals, and farms, as well as

waste from aquatic environments) in conjunction with helpful bacteria (biofertilizers). They contribute to the release of nutrients, which in turn contributes to enhanced output that is more sustainably grown. It places an emphasis on agricultural production in an environment that is environmentally friendly and free of pollutants. Organic farming is defined by the United States Department of Agriculture (USDA) as a system that avoids or largely excludes the use of synthetic inputs (such as fertilisers, pesticides, hormones, feed additives, etc.) and instead relies on crop rotations, crop residues, animal manures, off-farm organic waste, mineral grade rock additives, and biological systems of nutrient mobilisation and plant protection to the greatest extent possible.

OBJECTIVES

1. To investigate the distribution of a variety of insect fauna across a variety of crop patterns.
2. To evaluate the effectiveness of insect pest control strategies across a variety of crop patterns in the Shekhawati area.

Crop pattern in Rajasthan

Significant foods include bajra, wheat, barley, guar, and mustered oil. Pulses also play an important role. Products Grown in the Jhunjhunu Region, Kharif crops make up the majority of the field output during the monsoon season. Other crops grown in the region include tarmara, cotton, gramme, and chillies; however, production of these crops is not done on a commercial scale. The total land used for growing several primary crops in the Jhunjhunu Region in 2011 as well as the total amount of those crops produced

WHEAT: The majority of India's wheat crop is produced in the country's northernmost states, which benefit from a mild winter temperature, as well as alluvial plains that are relatively flat and well-drained by rivers and canals. In India, the states of Punjab, Haryana, Uttar Pradesh, Uttaranchal, Madhya Pradesh, Chattishgarh, Rajasthan, and Bihar are the most productive wheat-producing states, together accounting for more than 90 percent of the nation's total wheat output. In recent years, there has been a rise in the usage of mechanised farming techniques, such as tractors, seed drills, plant thrashers, and combines, for the purpose of harvesting crops. Because of this, output has significantly risen, which has brought the cost of cultivation down. Loamy or loamy-sandy soils that are able to retain moisture and are rich in nutrients are ideal for the cultivation of this crop. Clay-loam soils that have adequate drainage consistently provide bountiful crops.

Rainfed wheat may be cultivated in regions that get between 25 and 75 centimetres of rain annually. The winter cyclonic rains in northern parts of India, also known as "Mahawat," which occur from December through February as a result of a secondary depression in the Mediterranean region are exceptionally

beneficial for the growth of crops, which in turn leads to a high level of agricultural output. Wheat is often cultivated in irrigated regions, with canals, wells, and tubewells serving as the most common types of irrigation systems.

BAJRA The state of Rajasthan relies heavily on bajra as its primary source of food. This millet can be cultivated on sandy soil when circumstances are rainfed, and as a result, it is important in the dry area of Rajasthan. This cereal grain crop is also cultivated abundantly in the desert tract that encompasses Gujrat, Uttar Pradesh, Karnataka, Maharashtra, and Andhra Pradesh. Its fodder is an essential component of the diet of animals used for milk production, and it may also be used as a staple meal.

Bajra is more common in locations that have a high average temperature during the day. Temperatures average between 250 and 350 degrees Celsius during the growing season. The optimal amount of rainfall required is anywhere between 35 and 50 centimetres. It is possible to cultivate bajra in regions that get an annual rainfall of less than 35 centimetres. It's possible that lengthy periods of warm weather with little rain might be damaging to crops and lead to their failure. The most ideal conditions for harvesting are dry, warm, and sunny weather.

There has not been a significant rise in the production of Bajra despite the fact that multiple strains of new hybrids of Bajra have been produced. This is mostly due to the fact that this crop is still primarily dependent on rain for its sustenance. Crop failures are caused by either the absence of the monsoon or an unequal distribution of its rainfall. Bajra's production in Rajasthan during the last several decades has thus ranged from 89 kg/ha (1979-80) to 714 kg/ha (2003-2004), mostly due to climate change. As a result of its resistance to high heat and drought, as well as the fact that it can compete well with other kharif crops, its cultivation is mostly high in regions with low and variable rainfall.

GUAR: The guar plant is an important crop that is produced in many parts of the nation not only for the fodder it produces but also for the gum that can be extracted from its seeds and has significant commercial value. The gum finds use in a wide variety of sectors, including textiles, confectionaries, explosives, oil exploration, and, most importantly, gum. There has been a significant increase in the number of enterprises, mainly in western Rajasthan, that are dedicated to the extraction of gum. This gum is sent overseas, which results in a healthy amount of revenue for the state in the form of foreign currency. More than 30 lakh hectares are used for the cultivation of this crop throughout the nation, with the most of it coming from the state of Rajasthan (approximately 76 percent), followed by Punjab, Haryana, Uttar Pradesh, Uttar Pradesh, Uttranchal, and Gujrat. The crop is cultivated during kharif, and the majority of it is grown as a rainfed crop. As a result, the area that is devoted to growing this crop and the amount that it produces varies each year depending on the pattern of rainfall.

The most land is devoted to growing cotton in the Indian state of Rajasthan, particularly in the western regions, which include soils with a finer texture, good drainage, and annual precipitation ranging from 10 to 30 centimetres. The crop is sowed just before the monsoon season begins. The crop may either be broadcast or line-sown, with the latter method helping to facilitate the process of intercultural operations and giving significantly better yield. Sowing the crop in both ways results in the same crop. It is also produced as an irrigated crop in various regions of the state, particularly the vegetable variety, where there is a reliable supply of water for irrigation. Over 67590 hectares of land are used for the cultivation of guar in the Jnunjhunu Region. 2011 was the year that had the highest output at 11339 tonnes.

GROUNDNUT: India is in first place in the globe, both in terms of total land area and total output, and this is the case. Depending on the types and the agronomic circumstances, the amount of oil that is contained in the seed might range anywhere from 44 to 55 percent. Both in its refined form and in the form of vanaspati ghee, its oil is put to significant use in the kitchen as a cooking medium. In addition to that, it has use in the cosmetics, lubricants, and soap industries. Raw kernels, roasted kernels, and kernels that have been sweetened may all be consumed. They include a high quantity of proteins in addition to vitamins A and B. Because it is a legume and has root nodules, it has the ability to fix atmospheric nitrogen, which in turn increases the fertility of the soil.

One of the states that produces groundnut is Rajasthan. Other states that produce groundnut are Andhra Pradesh, Gujarat, and Karnataka. Supplemental irrigation is being supplied to high producing strains of groundnut crops in the states of Gujrat, Andhra Pradesh, and Karnataka. This is done in consideration of the high production efficiency of the groundnut crop. This kind of plant is cultivated on more than 61 percent of the land that is irrigated in Rajasthan's Jaipur and Bikaner Region (2003-04), which is also where the state's agricultural output is at its highest.

KHARIF PULSES:

Due to the high concentration of vegetable proteins that may be found in pulses, they are of considerable importance to human beings. They are cultivated mostly in regions that are nourished by rain. The provision of region-specific technical packages, inputs, and services should be the primary emphasis of any development plan aimed at increasing the production of pulses. The results have proven quite encouraging, and as a direct consequence, there has been a discernible rise in the output of pulses over the last several years.

The state of Rajasthan is characterised by its arid climate and has barely one percent of the overall water resources of the nation although accounting for ten percent of the entire land area. Agriculture in this region is highly reliant on rainfall, and the majority of the land can only produce a single crop each year—

during the monsoon season. The region receives an average of 58 centimetres of rainfall per year, and 61 percent of the land is classified as desert or semi-arid. The soil has a high infiltration rate, is alkaline and salty at the same time, and has a limited ability to store water. The pattern of cropping was designed with the goal of satisfying both the demand for food among the humans and the need for fodder among the animals. The majority of the crops are cultivated under hazardous conditions. The fertility of the land differs from district to district as well. The unequal distribution of land is one of the most significant obstacles standing in the way of the development of agriculture. More than seventy-five percent of the state's soils are in poor condition, lacking essential nutrients such as nitrogen, phosphorus, sulphur, zinc, and iron. According to a survey, the districts of Sri Ganganagar, Churu, Jhunjhunu, Bikaner, Jaisalmer, Nagaur, and Barmer, as well as a portion of Jodhpur and Sikar, have some of the least fertile soil in the country. The unproductive soil in these states has an effect on the amount of agricultural yield.

Despite the fact that the state's rainfall patterns are both erratic and unpredictable, the majority of the state's agriculture is still dependent on rain. There are two primary growing seasons known as Kharif and Rabi. During these times, grains, oil seeds, and pulses are grown provided that the rainfall is typical. During the Kharif season, the most important crop is bajra, whereas wheat dominates during the Rabi season. Fertilizer usage (NPK) in Rajasthan is one of the lowest in all of India; as a result, the state sometimes experiences a scarcity of fertilisers during the peak growing seasons. With addition, the state has been encouraging farmers to utilise urea that has been coated in neem in order to maximise the amount of nitrogen that may be used. Organic farming is receiving more attention in the state as a result of its lower overall production costs.

During the course of this research, a variety of topics, such as biological control, factors that limit parasitism, environmental effects on the population densities of both pests and natural enemies, augmentation of natural enemies, etc., will be discussed. These topics will be covered over the course of the research period. The purpose of this study is to investigate the effects of pesticides, not only on the populations of pests, but also on the grains that have been kept. Monitoring is also necessary for determining how pesticide application affects the variety of insect life. This involves an analysis of the possible impacts that they may have on wildlife and insects, as well as the collection of samples to check for the presence of pesticide residues in food grains. The presence of insect predators and parasitoids is a natural occurrence in almost every agricultural and natural ecosystem. A greater yield will result from the employment of predators and parasitoids to reduce the populations of pests. This will be accomplished by reducing the amount of damage caused by the pests. For the purpose of implementing biological control in any agroecosystem, there has to be a methodical and correct identification of the pests and the natural enemies that are linked with them. When the research is complete, we will be able to advise farmers on the methods most likely to result in successful management of the invasive insect pest.

CONCLUSION

Knowledge is one of the fundamental components that has a significant impact on the degree to which scientific methods are implemented. It will be possible for farmers to increase their profits by expanding their knowledge and skills in the use of new scientific procedures in the agricultural industry. One of the most significant parts of enhancing farmers' knowledge is providing them with training. The dissemination of technological know-how is essential to the rapid growth and radical change of rural societies. Farm science centres, also known as Krishi Vigyan Kendras and having districts under its authority, are playing a significant role in teaching the agricultural population and, as a result, increasing their production and revenue. As a result, the current research was carried out in the Sikar region of Rajasthan in order to determine the amount of farmers' knowledge about the enhanced production technique of onion. This was done with the goal of developing an effective training programme. The general degree of understanding on the technologies involved in onion production was moderate. The most understanding was shown in the process of field preparation, the transplanting of nursery plants, and the control of irrigation systems. The degree of knowledge that farmers have about the many parts of onion producing technology has to be raised.

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