



A Study About Crop Diseases And Their Pathogens In Taranagar Area Of Churu District (Rajasthan)

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Abstract- This study presents a comprehensive listing of crop diseases and their associated pathogens observed in the Taranagar region, located in the Churu district of Rajasthan, India. Agriculture in this semi-arid area is vital to the local economy, yet crop productivity is frequently affected by a range of plant diseases. The survey, conducted over multiple cropping seasons, documented common diseases affecting major crops such as wheat, mustard, gram, bajra, and guar. Each disease was identified based on field symptoms and laboratory confirmation of causative pathogens. The results indicate the prevalence of fungal pathogens such as *Puccinia striiformis* (causing yellow rust in wheat), *Alternaria brassicae* (affecting mustard), and *Fusarium oxysporum* (causing wilt in gram). Bacterial and viral diseases were also noted, including bacterial blight in guar and yellow vein mosaic virus in mungbean. The findings serve as a valuable resource for farmers, agricultural officers, and researchers to develop targeted disease management strategies and enhance crop health in the region.

Keywords- crop diseases, agriculture, taranagar, rajasthan.

Introduction- Agriculture is the backbone of rural livelihoods in Rajasthan, particularly in regions like Taranagar in the Churu district, where a majority of the population depends on farming as their primary occupation. Despite advances in farming practices, crop health continues to be a major concern for farmers in this semi-arid region. One of the critical challenges faced by the agricultural sector is the outbreak of crop diseases, which significantly reduce both the quality and quantity of yields. These diseases are caused by a variety of pathogens including fungi, bacteria, viruses, and nematodes, and their occurrence is influenced by several factors such as climatic conditions, soil properties, irrigation methods, and crop management techniques.

Taranagar, characterized by its arid climate, limited rainfall, and sandy soils, provides a unique ecological setting where certain crop diseases are more prevalent. Crops like wheat, mustard, bajra (pearl millet), and gram are commonly cultivated in the region. However, recurrent disease outbreaks such as rust in wheat, downy mildew in bajra, and blight in mustard threaten the productivity of these staple crops. These issues not only affect the economic stability of the farmers but also pose a risk to food security in the region.

This study aims to systematically investigate the crop diseases occurring in the Taranagar area, identify their primary pathogens, and analyze the environmental and agricultural factors that contribute to their spread. The findings are expected to benefit farmers, agricultural extension workers, and policymakers in designing integrated pest and disease management approaches suitable for arid regions like Taranagar.

Study area – The present study was conducted in the Taranagar tehsil of the Churu district, located in the north-eastern part of Rajasthan, India. Geographically, Taranagar lies between latitude 28.67° N and longitude 75.03° E, and is part of the semi-arid zone of the Thar Desert. The region is characterized by extreme climatic conditions, with hot summers, cold winters, and low and erratic rainfall, averaging around 300–400 mm annually, mostly during the monsoon season (July to September).

The soil in this region is predominantly sandy to sandy loam, with low organic content and limited water-holding capacity. These soil conditions, combined with high temperatures and water scarcity, make the area vulnerable to frequent crop stress, which in turn increases susceptibility to various plant diseases.

Taranagar is primarily an agriculture-dependent region, with key crops including wheat, mustard, bajra (pearl millet), gram (chickpea), and guar (cluster bean). Farmers in this region largely rely on traditional farming methods, although some have adopted improved practices under government schemes. However, a lack of awareness and resources often leads to inadequate disease management.

This specific agro-climatic and socio-economic context makes Taranagar a relevant and important location for studying the occurrence and impact of crop diseases and their associated pathogens. The findings from this region could provide insights applicable to other arid and semi-arid areas facing similar challenges.

Methodology- To investigate the crop diseases and their associated pathogens in the Taranagar area of Churu district, a systematic approach was adopted, involving field surveys, sample collection, laboratory analysis, and interaction with local farmers. The study was carried out over two cropping seasons to ensure accuracy and consistency of data. Visual inspection of crops was performed to identify symptoms of disease such as leaf spots, wilting, blights, mildew, rusts, and root rot. Photographs and field notes were taken for documentation.

Collected samples were analyzed using the following techniques: Microscopic Examination, Culture Techniques, Gram Staining and Biochemical Tests.

Data on disease incidence, severity, and pathogen identification were compiled and analyzed using statistical tools to determine correlations between environmental conditions, farming practices, and disease outbreaks.

Results and Discussion- The study revealed a significant presence of crop diseases across the Taranagar region, affecting major crops such as wheat, mustard, bajra, and gram. The findings highlight the urgent need for improved disease diagnosis and sustainable management practices. A lack of access to agricultural extension services and modern disease control methods has resulted in economic losses and reduced crop yields. Through this study the author has listed the crop diseases of the Taranagar region which are listed in Table -01

Table -01

Crop diseases and their pathogen of Taranagar Region

S.N.	Disease name	Pathogen	Symptoms
1	Downy mildew of Bajra	<i>Sclerospora graminicola</i>	Chlorotic streaks on leaves, Downy growth on lower leaf surface, Leaf shredding, Stunted growth, Phyllody, Green ear symptoms, Malformed panicles.
2	Smut disease of Bajra	<i>Sphacelotheca reiliana</i>	black or brownish-black spore sacs (smut balls), Partial or complete ear infection , No major effect on vegetative growth.
3	Rust disease of Bajra	<i>Puccinia substriata</i>	Reddish-brown pustules on leaves, Pustule clustering, Leaf drying, poor grain filling.
4	Root rot of moth bean	<i>Rhizoctonia solani</i>	Poor germination, Damping-off, Yellowing and wilting, Root discoloration, Dry root rot (especially with <i>Macrophomina</i>), Stunted growth, Sudden plant death.
5	Powdery mildew of moth bean	<i>Erysiphe polygoni</i>	White, Powdery Growth, Yellowing of Leaves (Chlorosis), Leaf Curling and Deformation, Premature Leaf Drop, Reduced Pod Formation, Spore Formation on Pods.
6	Leaf spot of moth bean	<i>Alternaria alternata</i>	Small, Dark, Round or Irregular Spots, Larger Lesions, Yellowing of the Surrounding Tissue (Chlorosis), Premature Leaf Drop, Reduced Photosynthesis, Pod Infection.
7	Yellow mosaic of moong bean	<i>Yellow mosaic virus</i>	Yellow Mosaic on Leaves, Leaf Deformation, Stunted Growth, Flowering and Pod Formation, Overall Plant Yellowing, Streaks and Speckles.
8	Collar rot of groundnut	<i>Aspergillus niger</i>	Rotting of the Collar Region, Lesions and Necrosis, Yellowing of Leaves, Wilting and Collapse, Root Decay, Premature Plant Death.
9	Rust disease of groundnut	<i>Puccinia arachidis</i>	Yellowish Spots on Upper Leaf Surface, Rust-colored Pustules, Leaf Curling and Distortion, Premature Defoliation, Reduced Pod Formation, Stunted Growth.
10	Leaf spot of groundnut	<i>Cercospora arachidicola</i>	Small, Round or Irregular Spots, Larger Lesions, Leaf Yellowing, Premature Leaf Drop, Pod Infection, Stunted Growth.
11	Wilt of chick pea	<i>Fusarium oxysporum</i>	Sudden wilting, Leaf discoloration, Dark brown discoloration of vascular tissues, plant collapse and death, patches in the field.
12	Blight of chick pea	<i>Ascochyta rabiei</i>	circular to irregular dark brown spots on leaves, dark border with a gray or tan center, black fruiting bodies, leaf drying and defoliation, dark brown to black lesions on stems, black or brown spots on pods.
13	Rust disease of wheat	<i>Puccinia species</i>	Small, round to oval orange-brown pustules, Leaves may dry prematurely, black telia (teliospores) may appear.

14	Powdery mildew of wheat	<i>Blumeria graminis</i>	white, powdery fungal growth on leaf surfaces, entire leaf surface can be covered in white mildew, turn yellow, brown, or purplish, and leaves may curl and die, tiny black dots (cleistothecia).
15	Head blight of wheat	<i>Fusarium graminearum</i>	Premature bleaching of one or more spikelets on the wheat head, Pink or salmon-colored fungal growth, Shriveled, light-weight, chalky or pinkish grains, called "tombstones", poor germination and reduced nutritional value.
16	White rust of mustard	<i>Albugo candida</i>	white to creamy pustules (blister-like swellings), chlorosis, pustules coalesce, hypertrophy (enlargement) and malformation of floral parts, Inflorescences become swollen and distorted, Stagheads are greenish to creamy white, Pods may become distorted, swollen, and sterile.
18	Leaf spot of mustard	<i>Alternaria brassicae</i>	small, circular to oval brown spots with concentric rings, giving a target or bullseye appearance, large necrotic areas, leaf drying, defoliation, Elongated lesions, premature pod shattering.
19	Downy mildew of mustard	<i>Hyaloperonospora parasitica</i>	Pale yellow to light green patches appear, grayish-white to violet downy growth, Infected leaf areas may turn necrotic, Leaves may curl, become distorted, and fall off prematurely, Stunted growth, malformed flowers, pods may not form properly or may be twisted and small.
20	Rust disease of aonla	<i>Puccinia emblica</i>	small, reddish-brown pustules on the underside of leaves, yellowish or chlorotic spots, leaf deformation or drying, Affected leaves may curl and drop prematurely, shoots may become stunted or die back.

Conclusion- The methodology for listing crop diseases and their pathogens in the Taranagar area offers a comprehensive, data-driven approach to improving agricultural health and productivity in the region. By combining field surveys, laboratory analysis, and community involvement, this process ensures accurate identification and understanding of disease prevalence and its impact on crops.

Through systematic data collection, pathogen identification, and geographical mapping, farmers can gain crucial insights into the diseases affecting their crops. The subsequent reporting of these findings, along with recommended management practices, will provide the foundation for sustainable agricultural practices. Educating the local farming community and establishing long-term monitoring will further enhance disease management efforts and contribute to reducing crop loss.

In conclusion, the effective listing and identification of crop diseases and pathogens in Taranagar not only improves disease management but also empowers local farmers with knowledge and tools to combat crop diseases, ultimately contributing to increased crop yield and overall agricultural productivity in the area. Furthermore, the collaboration between researchers, agricultural experts, and farmers will strengthen resilience against emerging diseases and ensure sustainable farming practices for the future.

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