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A Brief Survey on Diseases of Paddy Plant

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Abstract:

World population shows the need for improvement in productivity. Productivity of cereals can be increased by protecting the plants and preventing them from diseases. Identification of diseases plays a major role in prevention or protection of plants. In this study, Oryza Sativa is considered. Normally the paddy is affected by bacteria, viruses or by fungi. The productivity of rice can be increased by proper identification of diseases and preventing in the earlier stages.

Keywords: Disorders, Rice plant, Symptoms

1. INTRODUCTION:

Disease identification is one of the major solutions to improve the productivity. This also helps to select the pesticides and prevent from further spreading. Early detection of diseases will assist in enhancing the productivity. This classification study will help in easy identification of paddy plant diseases.

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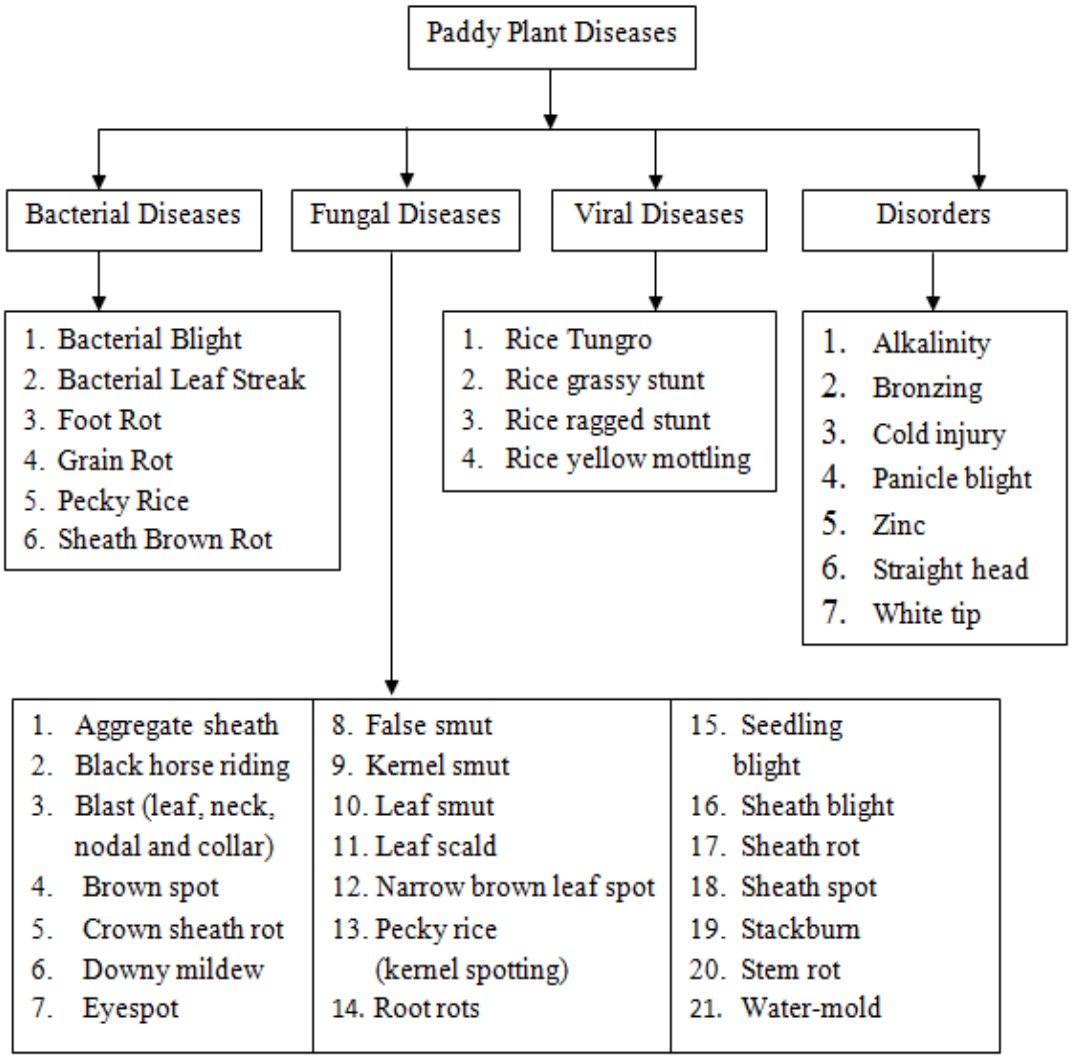
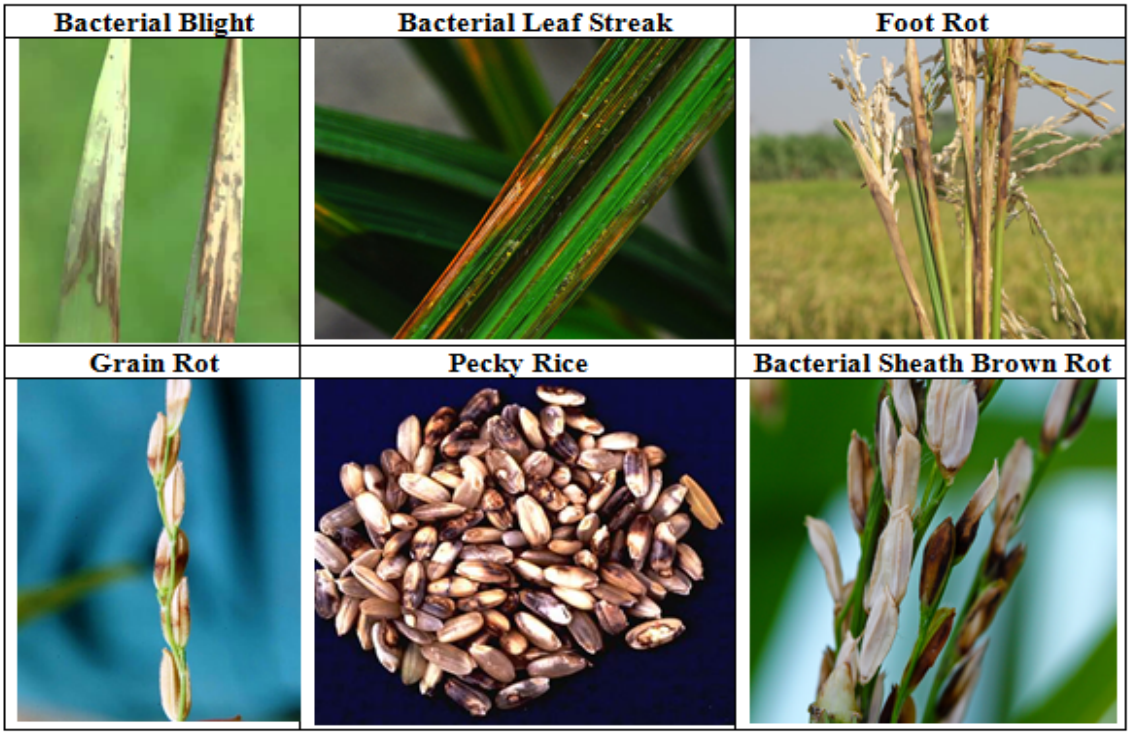
2. CLASSIFICATION OF DISEASES:

The paddy plant is affected by various types of diseases. They can be grouped under different varieties like the diseases affected by bacteria, diseases caused by viruses, fungal diseases and disorders.





3. BACTERIAL DISEASES:

These are the diseases affected by bacteria. The bacterial diseases are classified based on the bacteria. Bacteria affect different parts of paddy plant. They are listed below.

3.1 Bacterial Blight

This disease is identified as the leaf turns into turbid when it is kept in water. This is due to bacterial ooze. It can be viewed as water-soaked to yellowish stripes on leaf blades or starting at leaf tips then later increase in length and width with a wavy margin. Appearance of bacterial ooze that looks like a milky or opaque dewdrop on young lesions early in the morning and lessions turn yellow to white as the disease advances.

3.2 Bacterial Leaf Streak

Bacterial leaf streak is caused by genus Xanthomonas oryzae pv. oryzicola. Infected plants show browning and drying of leaves. beneath severe conditions, this might result in reduced grain weight because of loss of photosynthetic space. microorganism leaf streak happens in areas with hot temperature and high humidness. it's transmitted through seeds and infected stubbles to consequent planting season. It will occur in fields wherever X. oryzae pv. oryzicola microorganism is gift on leaves, within the water, or within the rubble left when harvest.

3.3 Foot Rot

Foot rot or Bakanae malady - Fusarium moniliforme (Sexual stage: Gibberella fujikuroi) Symptoms. Infected seedlings in nursery square measure lean and lanky, a lot of taller and die once your time. within the main field, the affected plants have tall lanky tillers with longer internodes and aerial accidental roots from the nodes on top of ground level. the foundation system is fibrous and bushy. The plants square measure killed before earhead formation or they turn out solely sterile spikelets. once the stem is split open white mycelial growth will be seen.

3.4 Grain Rot

Symptoms Burkholderia glumae

Seedling symptoms of B. glumae infection include brown, water-soaked soft rot of the leaf sheaths accompanied by wilting or soft rot of the leaves. Bacterial grain rot usually begins during the milk stage and infections which occur at heading become more damaging. On a mature plant, infected spikelets of the panicle are unevenly distributed.

3.5 Pecky Rice

This is also named as kernel spotting. This is due to feeding of stink bugs and fungal growth.

Fungi which cause the paddy plants in kernel spotting are *Cochliobolus miyabeanus, Curvularia spp. , Fusarium spp. , Microdochium oryzae, Sarocladium oryzae etc. If the plant is affected by* Pecky Rice fungi then many or all florets per panicle are dried-up and discolored to a light to dark brown, reddish-brown, purple or white.

3.6 Bacterial Sheath Brown Rot

Sheath brown rot is caused by *Pseudomonas fuscovaginae*. It causes decomposition in sheaths and grains of seedlings and mature plants. Symptoms generally occur on the flag leaf sheath at booting stage and on the raceme. At spermatophyte stage, a general discoloration happens, which can unfold to the mid-vein or veins of the leaves. Infected seedlings at the start show yellow and brown discoloration on the lower leaf sheath.

4. FUNGAL DISEASES

4.1 Blast

Blast is one of the major diseases which affect the grain yield. This is due to fungus called Magnaporthe Oryzae. This can affect all the parts of the plant above to the earth level. This is due to the blast spores. Most commonly leaves, collar, node and neck are affected. The dew formation on the leaves helps the development of the disease. The affected area will look like a burnt part. Initial symptom is a white to gray-green spot.

4.2 Sheath Blight

Paddy plants affected by tungro exhibit stunting and reduced tillering.

4.3 Sheath Rot

Sheath rot looks like Irregular spots or lesions, with dark reddish brown margins and gray center and also discoloration in the flag leaf sheath. Lesions enlarge and often cover the entire leaf sheath. Severe infection causes entire or parts of young panicles to remain within the sheath. The unemerged panicles become rot and florets turn reddish brown to dark brown. Also whitish powdery growth can be seen inside the affected sheaths and young panicles.

4.4 Brown Spot

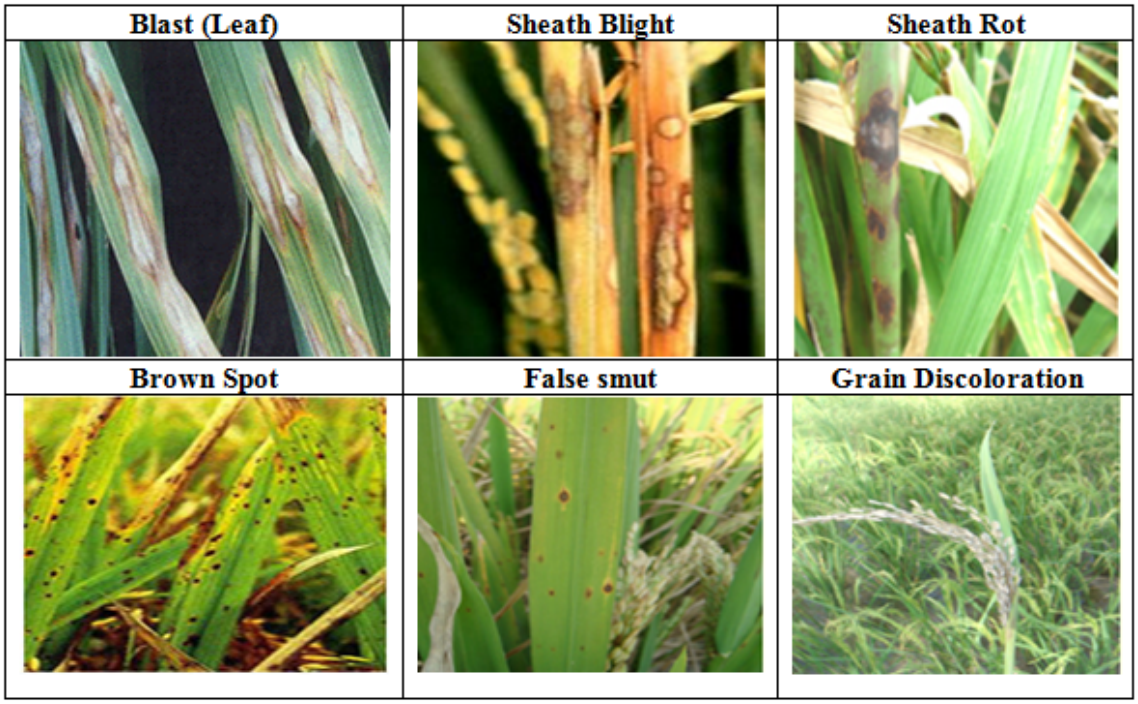
This occurs normally where seedlings are developed rather than the main field. This brown spot is common in leaf. It resembles like a sesame seed, that is, brown sopt in round or oval. Sometimes these spots form large patches also. Rice grain got affected gue to this infection. This infection also occurs as brown in panicle neck. This infection may reduce the yield to half.

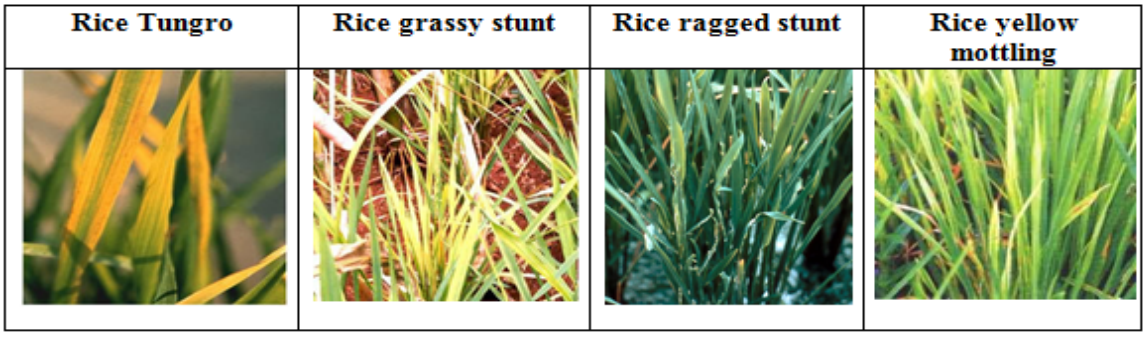
4.5 False smut

Normally false smut affects few grains in a panicle and the remaining will be normal. Individual grain is affected and they tuned to a yellow mass. Symptoms can be seen as a growth of soft spores around floral parts. When these spores mature then they turned from orange to greenish black or yellowish green.

4.6 Grain discolouration

This will happen in the grains during milk stage. Discolouration occurs in grains either as brown or black spots. Infection is due to high fungal growth during humid condition.





5. VIRAL DISEASES

5.1 Rice Tungro

Paddy plants affected by tungro exhibit stunting and reduced tillering. Their leaves turn yellow or orange-yellow and they have rust spots. Discoloration begins from leaf tip and extends down to the blade or the lower leaf portion. This cause delayed flowering and have sterile panicles or partially filled grains.

5.2 Rice grassy stunt

Rice grass like stunt virus reduces yields by inhibiting raceme production. Rice grass like stunt virus affects rice crops in areas wherever continuous and year-round rice growing is practiced. The virus is transmitted between paddy plants by insect vectors. Nymph and adult stage plant hoppers square measure common vectors for rice grass like stunt virus. The plant hoppers ought to take advantage of associate infected plant for a minimum of half-hour to pick-up the virus. Plants may be infected the least bit growth stages. they're most susceptible to infection at the tillering stage. Rice grassy stunt virus symptoms develop 10−12 days once infection. It cannot be transmitted via brown homopteran eggs. The aerobatics and excessive tillering symptoms of rice grass like stunt may be confused for symptoms of rice unwellness and rice dwarf disease. to substantiate Rice grassy stunt virus, can be seen as rosette look of plants and outstanding rusty spots on the leaves.

5.3 Rice ragged stunt

Rice ragged stunt virus reduces yield by inflicting part exerted panicles, empty grains and plant density loss. it's vector-transmitted from one plant to a different by brown plant hoppers. Leaves of infected plants have a ragged look. the first arthropod nymphs of brown plant hoppers ar additional economical transmitters of rice ragged stunt virus than brown plant hoppers at older stages. If plants ar infected at seed plant stage, they develop new leaves with symptoms period of time when immunization. Leaves developed when this and till heading can show solely delicate or no symptoms. From heading forrader infected plants show symptoms once more on the higher leaves and flag leaves. The ragged look and twisted leaf symptoms will be confused with the injury caused by rice whorl grub and nematodes. to substantiate rice sedgelike stunt check for the presence of the brown homopteran vector, vein swelling and dark inexperienced color of leaves in addition as severe stunt flying.

5.4 Rice yellow mottling

Rice Yellow Mottle Virus (RYMV) is endemic and mostly restricted to the African continent, wherever it's been found in most of the rice-growing countries. The virus has additionally been reportable in Turkey. The causative virus may be a member of the genus Sobemo virus. it's a high genetic variability and therefore will evolve speedily, which suggests that it will overcome resistance genes within the rice plant. RYMV symptoms ab initio seem as chromatic rectangular to linear spots on the bottom of the youngest leaves. These spots later expand parallel to the leaf veins and seem as yellow or orange streaks. Leaves shaped once infection are patterned and infrequently twisted. The sickness additionally causes brown to chromatic discoloration and poor raceme exertion. Severely infected plants are scrawny, have reduced tillers, sterile spikelets, and eventually die. Plants infected twenty to fifty days once transplantation could show yellow stripes and spots, manufacture flowers and seeds, however has scrawny growth.

6. DISORDERS

6.1 Alkalinity disorder in rice

Alkalinity impairs plant growth by proscribing installation to the roots, so obstructing root development. It results to phosphorus and metal deficiencies, and probably iron deficiency and element toxicity. pH scale is comparatively rare particularly in irrigated rice systems. It is a retardant in rainfed areas with poor precipitation distribution or inside irrigated areas with poor water delivery. Symptoms show discoloured leaves starting from white to Venetian red, ranging from the leaf tips. Leaves may also have senescence or natural drying. In severe alkalic conditions, discoloration spreads down the leaf giving the plant a scorched look. Its symptoms is confused with gas deficiency. Sturdy alkalic soils additionally inhibit growth and tillering, inflicting plants to stunt, and leaves to roll. pH scale may also delay flowering and cause whiteheads. Plants have less ability to extract essential nutrients from the soil once broken by pH scale.

6.2 Bronzing disorder in rice

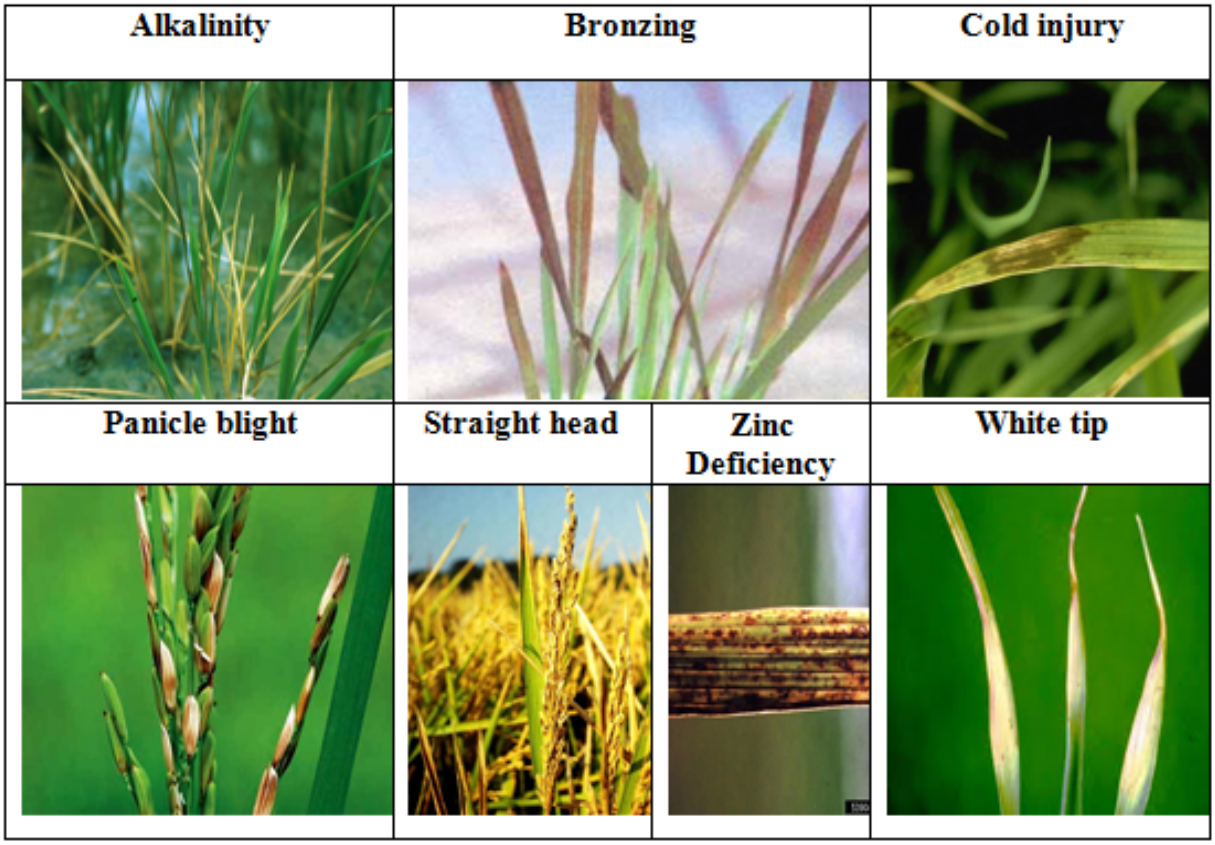
The bronze imbalance affects the rice plant growth.

6.3 Zinc deficiency

Zn deficiency comes to effect on plant after transplanting rice seedlings. There are multiple symptoms like brown marks and streaks. Sometimes Plant may die due to severe deficiency. This will cause a delay in maturity and also reduction in productivity.

6.4 *Cold injury*

Low temperature stress is one among the main abiotic factors that scale back rice yield in many countries. Losses will vary from zero.5 to 2.5 t/ha and grain yields will call up to twenty sixth, largely because of coldness throughout the procreative stage, albeit cold temperature are often harmful throughout the complete organic process stage of rice plants, from germination to grain filling. throughout germination, the foremost common symptoms of cold temperature harm square measure delayed and lower proportion of germination. throughout early growth stages, it will severely have an effect on phanerogam institution, showing yellowing of the leaves, growth retardation, and decreased tillering. once cold coincides with the procreative stage of the rice plant, sterility of the spikelets is that the commonest symptom of injury, however incomplete raceme exsertion and spike abortion may additionally occur, in conjunction with delayed and incomplete grain maturation.



6.5 Panicle blight

Panicle blight causes rice grain and seedling rotting. It is caused by the Burkholseria glumae that inhabits the soil. Lesions caused by different insects and other conditions that put strain on the plant enable the organism to penetrate more easily; it may also invade the plant through the hydathodes which are the stomas located on the underside and the edges of the leaves. This disease is transmitted through the seeds, flowers, leaves and residue of crops. It can live in the roots of the rice plant without showing any symptoms and during the booting stage it grows on its stems and leaves.

6.6 *Straight head on rice*

Fields that favor straighthead are permanent, that is, each time rice is planted, straighthead will develop at some level if the flood is not drained and the soil aerated at the appropriate time. Historically, it is unlikely to observe straighthead on clay soils. Straigh thead symptoms include darker green plants in the paddies, followed by blanked or blanked and distorted panicles

6.7 White tip on rice

Normally the white tip nematode affects paddy plants in moist areas. Currently this is distributed and can be seen wherever paddy is planted.

7. CONCLUSION

Nowadays field are developed with remote monitoring systems. Since the varieties of diseases are known, it is easy to classify the diseases by processing the input data like images. Thus to increase the productivity of the paddy field, the diseases of the paddy plant can be identified and controlled with the help of pesticides and fertilizers.

REFERENCES

1. Harshadkumar B Prajapati, Jitesh Shah, Vipul Dabhi Detection and classification of rice plant diseases, Intelligent Decision Technologies 11(3):357–373, 2017
2. R. P. Narmadha ; G. Arulvadivu , Detection and measurement of paddy leaf disease symptoms using image processing, 2017 International Conference on Computer Communication and Informatics
3. www.knowledgebank.irri.org/step-by-step-production/growth/pests...diseases/diseases
4. http://www.krishisewa.com/articles/disease-management/444-diseases-rice.html
5. http://agritech.tnau.ac.in/crop_protection/crop_prot_crop%20diseases_cereals_paddy.html