

EFFICACY OF DIFFERENT FUNGICIDES AGAINST BROWN RUST OF WHEAT

ABSTRACT

Wheat (*Triticum aestivum L.*) is one of the major crop grown in about all part of the world. In Pakistan wheat is one of the major cash crop. In Pakistan Punjab province is the major producer of high quality wheat crop. Wheat are attacked by many different pathogen including Bacterial, Viral and fungal pathogens and they cause a great losses in yield and quality of wheat. Specially the Brown rust which caused by *Puccinia triticina* is one of the major disease attacking wheat crop in open field. The aim and objective of this study is to determine the efficacy of different fungicide against brown rust of wheat at Plant Pathology Research Institute, Ayub Agricultural Research Institute, Faisalabad, Pakistan. Experiment was laid out in RCBD in 3 Replication. And the wheat variety which is used for this study is Akbar-19. Fungicide I.e Tilt, Amistar top, Belanty, Epic are checked. Tilt fungicide shows great result against brown rust.

Keywords : *Triticum aestivum L.*, Brown Rust, Pest and Diseases, Efficacy of fungicide, Wheat, Pyraclostrobin.

INTRODUCTION

Wheat is one of the most essential cereal crop grown worldwide (Curtis et al., 2002) and thought that it is the first crop ever to be cultured and its play an important role in human's economic and social improvement worldwide (Thabet and Najeeb, 2017). Wheat is major cereal crop which plays an important role in feeding a starved planetary and rising global food security (Ketema and Kassa, 2016). Wheat (*Triticum aestivum*) is the most widely grown cereal crop in Pakistan due to its holding, uses of grains and husk. Growth in yield is an alpha national goal to come across the constant increasing food's need. In Pakistan wheat was grown on an area of 8693 thousand hectares with yield production is about 24.2 million tones (Anonymous, 2012). Brown rust disease of wheat, caused by *Puccinia triticina* Eriks. has always been one of the leading restraint in wheat production. It causes huge yield losses that could reach 50%

sometime. Leaf rust happen more regularly and in more planetary regions than stem rust of wheat (*P. graminis f. sp. tritici*) or stripe rust of wheat(*P. striiformis f. sp. tritici*). The pathogen is heteroecious, and Hence needs a telial/uredinial host (usually wheat) and an secondary (pycnial/aecial) host (*Isopyrum fumaroides* or *Thalictrum speciosissimum*) to sheer the full life cycle. It therefore seems likely that the *P. triticina* area of beginning is the Potent Crescent region of the Middle East, where the natural range of the particular and alternative hosts overlap(D'Oliveira and Samborski, 1966).Rusts diseases causes upto 60 and 100% loss of wheat yield by leaf or stripe (yellow) rust and stem rust, respectively, (Park et al.,2007).

ABOUT PATHOGEN

Puccinia triticina is a macrocyclic and heteroecious rust fungi having five spore phase and two hierarchy unrelated host species. Urediniospores produced on wheat hosts are dikaryotic, and the width are 20 μm (Anikster et al ., 2005a).Wheat brown rust dispersed via airborne spores. In the life cycle of this fungus five types of spores are formed Urediniospores, teliospores, and basidiospores germinate on wheat plants and pycniospores and aeciosporesgerminate on the secondary hosts (Singh et ali.,2008) . The growth process requires wetness, and works best at 100% humidity. Optimal temperature for germination is betwixt 15–20 °C (59–68 °F). Before sporulation, wheat plants appear completely asymptomatic.

MATERIAL AND METHODOLOGY

Experiment was laid out in RCBD in three replication at Plant Pathology Research Institute ,AARI,Faislabad. Plot size was kept 3x2 meter square. For evaluation of fungicide, wheat variety “Akbar-19” was grown under Randomized complete block (RCBD) design . Standard Agronomic practiced were adopted to raise the crop under natural condition. layout plan of the experiment is also mentioned in the Table no 1.

Table no 1. number of Replications and treatments (Layout Plan)

| Replications | | Treatments | | | | |
|--------------|----|------------|----|----|----|----|
| R3 | T1 | T5 | T3 | T4 | T2 | T6 |
| R2 | T4 | T6 | T5 | T1 | T3 | T2 |
| R1 | T2 | T5 | T1 | T3 | T6 | T6 |

TREATMENTS

Wheat variety “Akbar-19” was grown under natural environmental conditions under Randomized complete block (RCBD) design. All fungicides are applied as per recommendation. Two sprays with the test fungicide was carried out after 10 days interval.

Table no2 .Treatment,Fungicide Trade name with active ingredients and dose per L

| Treatment no | Trade name | Active Ingredients | Dose |
|-----------------------|--------------------|--------------------------------|---------|
| T1 | Tilt | (Propiconazole) | 2ml/L |
| T2 | Amistar Top | (Azoxystrobin+Difenoconaz) | 2ml/L |
| T3 | Epic | (Epoconazole) | 4ml/L |
| T4 | Belanty | (Mefentrifluconazole) | 1.5ml/L |
| T5 | Pyraclos + epoxico | (Pyraclostrobin+epoxiconazole) | 3ml/L |
| T6(UnTreated Control) | Untreated Control | Nil | Nil |

Following data on the parameter were recorded as per AARI recommendation

- i. Disease incidence
- ii. Percentage disease over control

RESULT AND DISCUSSION

These result are taken during experiment is mentioned in Table no 3 .

Table no 3 . After Application of fungicides the % Disease incidence and Disease decrease over control

| Treatment no | Trade name | Active Ingredients | Disease Incidence (%) | %age Disease decrease over control |
|--------------|--------------------|--------------------------------|-----------------------|------------------------------------|
| T1 | Tilt | (Propiconazole) | 9.8% | 88.9% |
| T2 | Amistar Top | (Azoxystrobin +Difenoconaz) | 14.7% | 83.4% |
| T3 | Epic | (Epoconazole) | 15% | 83.1% |
| T4 | Belanty | (Mefentrifluconazole) | 17% | 80.3% |
| T5 | Pyraclos + epoxico | (Pyraclostrobin+epoxiconazole) | 29.5% | 66.8% |

T6(UnTrea
tment
Controlled
)

Un-Treated controlled

89%

66.8%

The highest disease incidence % is 89% which recorded in un Treatment controlled environment . T1(Tilt) give maximum decrease over control (88.9%). and other fungicide also show some effective response but the Tilt is Recommended because its shows the highest efficacy rate.

CONCLUSION

All the fungicide expressed significant results as compared to untreated control. Among all treatments , Tilt gave maximum decrease over control(88.9%). The second most effective treatment was Amistar top which gives (83.4%) disease decrease over control. On the 3rd the Epic was effective which reduced the disease level upto (15%) with (83.1%) disease decrease over control . While Belanty gives (80.3%) disease over control. On the other hand Pyraclostrobin+epoxiconazole not gives good result as compared to other fungicide. After studying and analyzing the result it is easy to said that Tilt is the most effective fungicide used against the brown rust , which helps to control brown rust and help to increase the crop yields by reducing yield loss that is caused by *Puccinia triticina*.

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