



Wheat Rust Situation and Pathogens survey in Nepal



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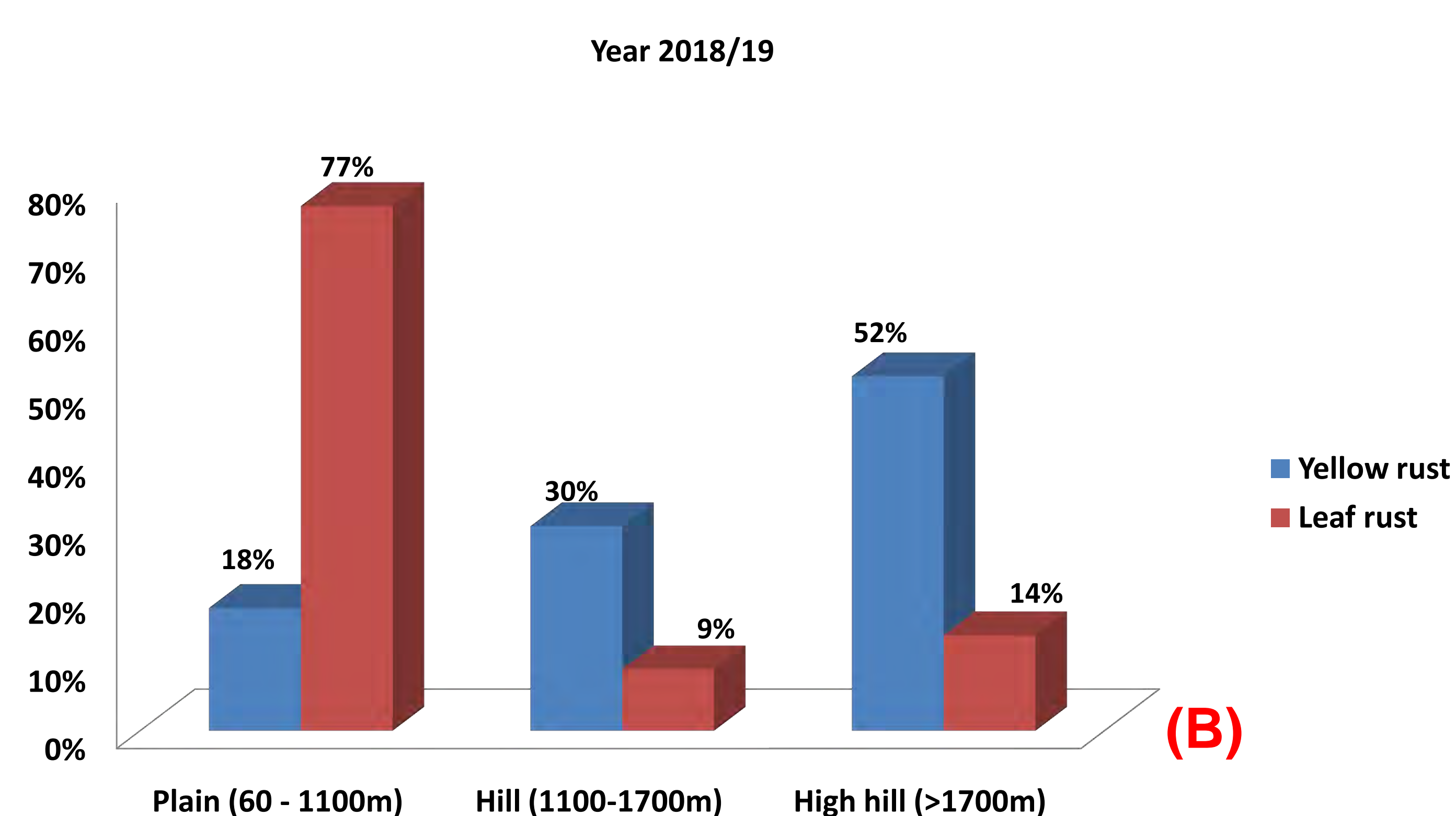
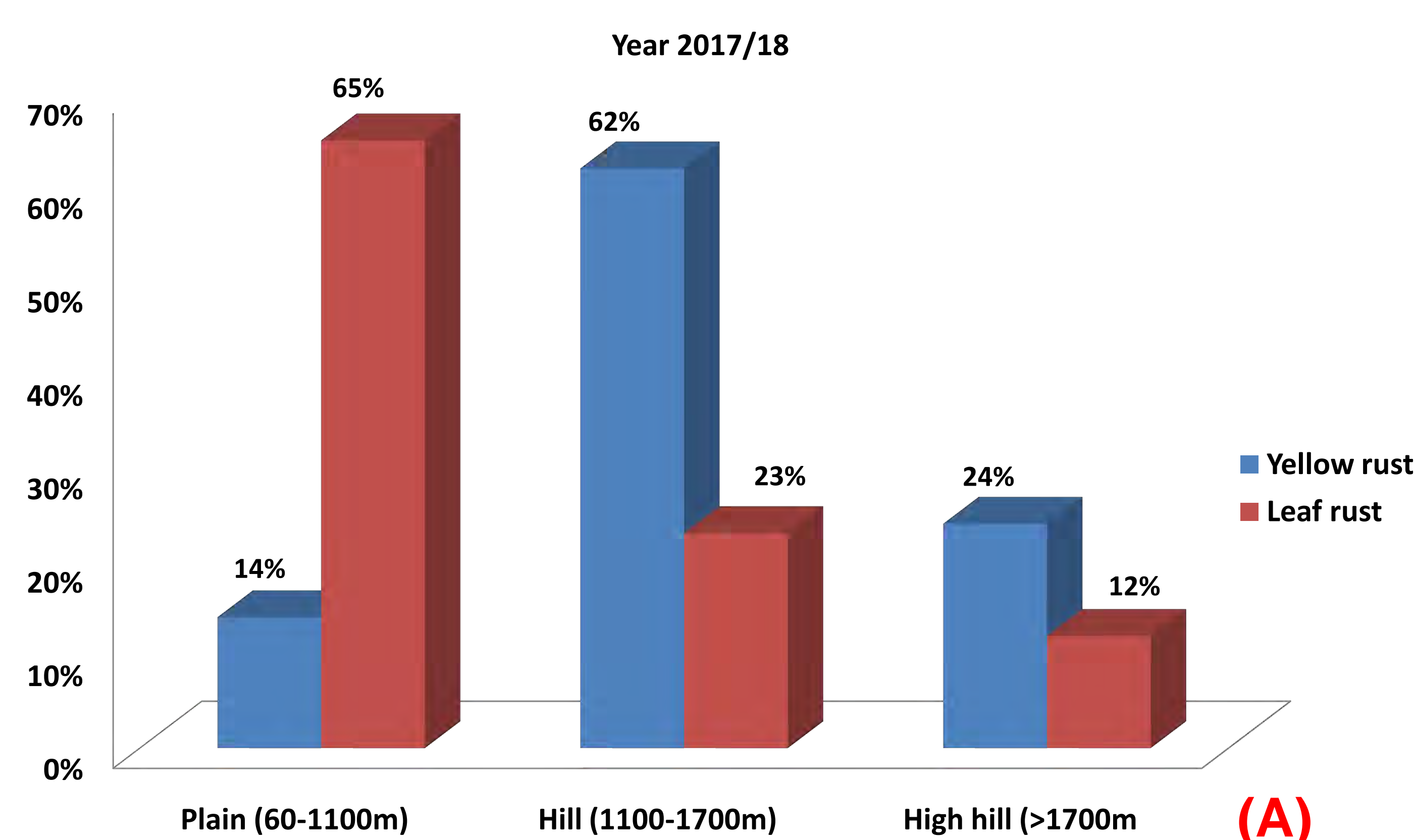
Introduction

Among the three rusts, leaf (or brown) rust caused by *Puccinia triticina* and stripe (or yellow) rust caused by *P. striiformis* pose a major threat to wheat production over large areas due to its several rounds epidemic by virulent pathotypes. They are mostly occurred either single or both almost all the wheat growing area of the country. These pathogens are extremely destructive, highly mobile, trans-boundary, and pose an imminent threat to millions of vulnerable smallholder farmers. In Nepal, yellow rust and leaf rust possess threat for wheat production in mid/high-hills and Terai regions, respectively. Besides, new virulence pathotypes/races of both yellow and leaf rust pathogens evolve in every season and attack recommended wheat genotypes.

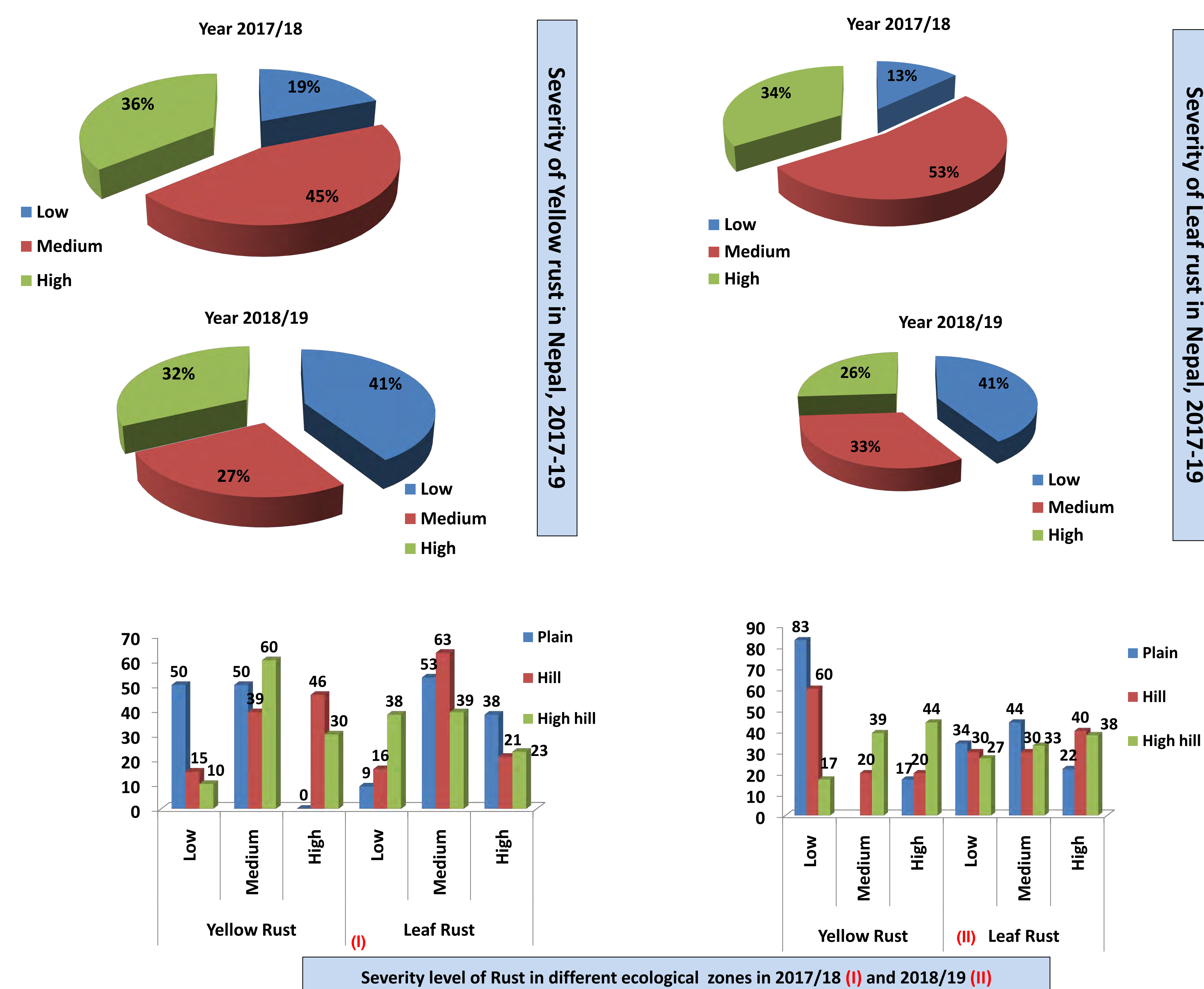
Materials and methods

- ❖ Regular monitoring, field survey and surveillance at disease hotspots of Terai and hills were done for digging out the actual status of wheat diseases. In the meantime, rust disease samples were also collected and pathotypes diagnosed.
- ❖ In total of 111 and 128 leaf samples, respectively were collected in 2018 and 2019 from different districts at 62m to 3164m from sea level.
- ❖ Rust survey covered 32 and 37 districts of seven provinces in 2018 and 2019, respectively.
- ❖ The collected leaf samples were analyzed for pathotypes at ICAR-IIWBR, Shimla.

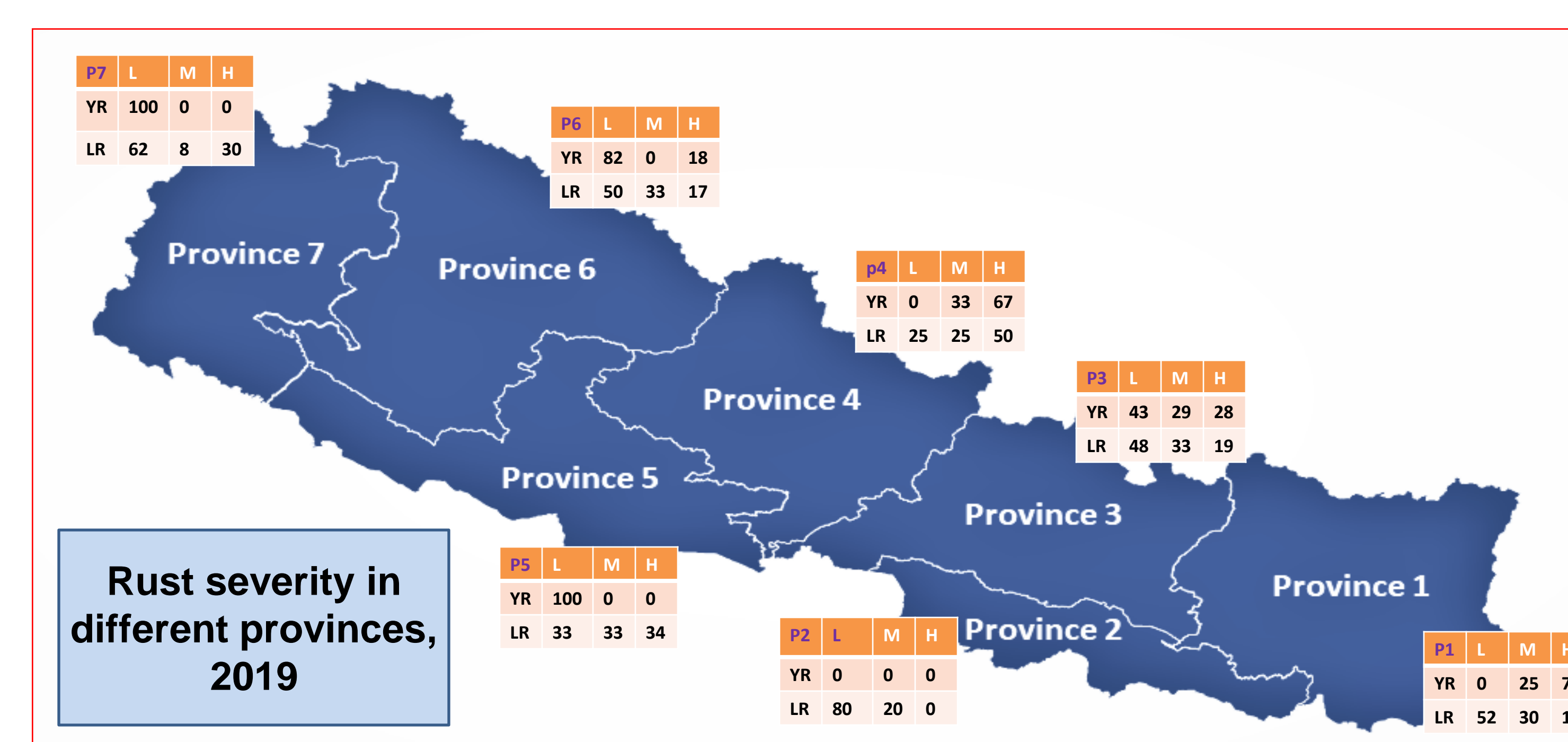
Result and discussion



Pattern of Rust disease incidence 2017/18 (A) and 2018/19 (B)



- The incidence of yellow and leaf rust diseases were found more than two third of total samples collected from hill and plain, respectively.
- Yellow rust recorded in plain area from nearly 15% samples and 13% samples from high hill recorded leaf rust disease.
- In 2019, the incidence of yellow rust was increased in high hill region than during 2018.
- The 80% yellow rust and 88% leaf rust samples had moderate to highly susceptible reaction in 2018 and they were reduced in nearly 60% in 2019.
- In 2018, the severity of yellow rust in plain was low to moderate level whereas low level during 2019.
- In mid hill, the severity level of yellow rust was medium to high in 2018 while the severity level was low in 2019, similarly in high hill, it was moderate level in 2018 but high during 2019.
- The pathotypes 46S119 and 78S84 of *P. striiformis* and 121R63-1 (THTTQ), 121R63 (THTTS), 49R45 (QPTHL), 109R31-1 (TGTTQ), 29R45 (FHTKL), 5R37 (FHHTL) pathotypes of *P. triticina* were the commonly recorded in both years.



Conclusion

- Rust is widely occurred across the country and the scenario of rust pathotypes and their reaction are usually vary in every year depending upon the **genetic diversity and climate change**.
- Monitoring races occurring in the necessary for successful planning to manage the rusts **by deploying effective genes for resistance** in the problem area.
- It is extremely important to keep vigilance of **new emerging rust races virulence** and their migration pathway.