Chapter-I

Introduction

The history of agriculture is about 10 thousand years old and since then attempts are being made to improve the agricultural production by providing better quality of seed, fertilizers, resistant crop varieties, herbicides, pesticides etc. Further, it is needed of the time to increased the production to meet the food requirement of the growing population. Scientists all over the world are trying to increase the crop production by providing healthy and disease free varieties to control spread of pathogenic disease. Study of physiological and biochemical changes induced by pathogen is really essential and by doing so gradually they are becoming more and more successful in providing disease free pure culture condition.

Wheat (Triticum aestivum L.) commonly known as Gehu belongs to family Gramineae (Poaceae) of monocotyledons. India accounts for about 35 percent of the global wheat production. The area under wheat constitutes roughly 14.0 percent of the total area under cereals and 10.0 percent of the total area under food grains in the country. The crop is grown mainly in the northern and central parts. It is not of much significance in the South. It is cultivated as a food crop mainly in U.P., Pubjab, M.P., Maharashtra, Bihar, Rajasthan and Gujrat.
Wheat is the second staple food crop of India and occupies about 29 million acres of land. It is mainly consumed by the people in the form of Suji, Maida and Ata, which are used for various purposes. The flour is used chiefly for making 'bread' and 'chapatis'. The flour is also used for making biscuits, cakes, pastry and similar articles. Wheat flakes are used as breakfast food.

Wheat is also used in the manufacture of beer and other alcoholic beverages. Wheat straw is used for seating chairs, stuffing mattresses etc. It makes a good food for livestock. Wheat straw is also used as fodder.

The wheat grains discovered as a result of the Indus Valley excavations at Mohenjodaro indicate that North-Western India was one of the ancestral lands of this cereal (Pal, 1966). The carbonised grains resemble those of Triticum sphaerococcum Percival an endemic species, which is still found in a few places in India. The wheat growing area in India can be divided into three zones. The Gangetic alluvium, the Indus Valley, and the black soil tract of Peninsular India. Wheat is also cultivated in Gujarat. A special feature of Indian wheat is the relatively short season in which it completes its life cycle. While the crop stands in the field for 9 to 10 months in some western countries, in India, it is ready for harvest in four to six months after sowing.

However, in the hilly tracts of Northern India and growing season for wheat is about nine months but the area under the crop in this region is very small.
Of the 18 recognized species under the genus *Triticum*, five are cultivated in India, of these *Triticum aestivum* Linn. commonly known as bread wheat, occupies the largest area and is mainly grown in the northern region. Next in importance is the macaroni wheat, *T. durum* Desf, which is the predominant sps. in central and western India. The area under *T. dicoccum* Schrank is grown in South India. *T. turgidum* Linn. the rivet wheat, and *T. sphaerococcum* Percival, the dwarf wheat are even less important.

In Northern India sowing of wheat is done in October-November. Wheat may be sown broad cast, either by hand or by sowing machines. Germination begins immediately and the first leaves appear with in a fortnight wheat is properly manured and irrigated. The crop is harvested by cutting the plants with a sickle close to the ground, in March-April. Threshing is the next process, and this involves the separation of the grains from the spike. Threshing is generally done under the feet of bullocks or by threshing machines. After threshing the wheat is winnowed and sifted. In Punjab, and also in other parts of the country the combines are introduced for the purpose. The combines reap, clean, thresh, winnow and sift the grains; wheat must be stored in firmly built structures, and it must be well ventilated.

The wheat crop suffers from a number of devastating diseases caused by fungi, bacteria, viruses, nematodes and environmental factors. However, in eastern Uttar Pradesh only fungal diseases, such as black rust (*Puccinia graminis* L. *sp. tritici* (Pers.), yellow rust
(Puccinia striiformis west), foliar blights (Helminthosporium sativum Pamm. King & Bakke and Alternaria triticina Prasad & Prabhu), loose smut (Ustilago nu da var tritici (Jens), Kernal bacont (Helvossia indica Mitra, Mundkur), and powdery mildew (Erysiphe graminis DC), are of major consequences.

With the change in cropping system, cropping intensity, crop management and varietal spread, the foliar blights are causing major losses to wheat crop in eastern Uttar Pradesh. A number of pathogens causing leaf blight, blotch and spots on this crop have been reported. Leaf blights in wheat are caused by species of Alternaria and Helminthosporium. Alternaria blight of wheat, in India was first reported in 1924 (Kulkarni, 1924; Mc Rae, 1924). Its outbreak in endemic form was reported in 1961 from Maharashtra, Bihar and West Bengal. It has now spread to almost entire wheat growing region of the country.

In view of the importance of the disease, efficient management practices are the need of the hour and making varietal resistance, a component of these practices, is the most economical and easily adoptable. However, multiplicity of artificial inoculation techniques available makes the selection of most efficient of imperative. A number of genotypes having different degrees of resistance have been identified, but this pool has to be augmented and search for materials with higher resistance continued. Several fungicides restricting disease spread and severity are available. But their doses and number of sprays
are to be further fine-tuned.

Thus, due to importance of the disease and lack of informations on many vital issues, the present study is necessary to strengthen the resistance breeding programme against foliar blight of wheat and its management.