

## Editorial

### Wheat Blast disease: A new threat to wheat cultivation in South Asia?

Wheat is a pillar for global food security, providing 20 per cent of protein and calories consumed worldwide and up to 50 per cent in developing countries. However, widespread cultivation of Wheat has also fostered numerous Wheat parasites that can infect and cause huge losses to the cultivators. One of the most fearsome and intractable wheat diseases in recent decades is Wheat Blast, caused by the fungus *Magnaporthe oryzae*.

First sighted in Brazil in 1985, Blast is widespread in South American Wheat fields, affecting as much as 3 million hectares in the early 1990s and seriously limiting Wheat cultivation. Plant Pathologists had warned that Wheat Blast could spread from South America to regions of South and Southeast Asia where conditions (hot and concurrent humid) are similar. Asia's first severe outbreak of Blast in major Wheat growing districts of South Western Bangladesh in early 2016 has validated that prediction.

The fungus is better known as a pathogen of Rice. But unlike in Rice, where *M.oryzae* attacks the leaves, nodes and panicles / necks, the fungus directly attacks the Wheat ear(spike) and can shrivel and deform the grain in less than a week from first symptom appeared , leaving cultivators no time to take action.

The pathogen can be spread by seed and also survives on crop residues. Blast appears sporadically on Wheat and can infect many grasses and other crops like Rice, Barley, Little Millets etc.

Hence, its further spread can be controlled through a combination of the following measures:

- Improved Wheat cultivars that carry genetic resistance to *M. oryzae* must be grown. Widely accessible genome data could help to combat the sudden outbreak of the disease. Scientists could use them to screen seeds for infection. Very recently the first gene variant has been reported which confer Wheat Blast resistance and field trials of crops that bear the resistance gene variant have begun in South America. But it seems that finding one variant is not enough. Wheat strains must be bred with multiple genes for durable resistance, to stop quickly breaking down their defenses by any environmental shift.
- Fungicides like Carpropamid, Ediphenphos, Iprobenphos, Tricyclazole, Isoprothiolane etc. which are generally recommended for Rice Blast, may be tried, but these provide a partial defense as the pathogen strikes the heads of Wheat, which are difficult for chemicals to reach. Fungicides are often hard to obtain or use in regions where Blast occurs, and must be applied as prophylactic measure which however might be expensive to many cultivators. Concurrently, advanced studies on potentially effective, safe and affordable chemical control measures along with cultural practices, such as crop rotation, seed treatment are to be taken up.
- Wheat Blast could spread from Bangladesh to other hot and humid wheat growing regions in South Asia and beyond, particularly in Indo-Gangetic Plain which would threaten the food security and livelihoods of hundreds of millions of cultivators.
- Lastly, vigorous surveillance of this deadly disease and rapid data sharing among scientists are also necessary.

Dr. Arunava Biswas

(biswas.arunavakol@gmail.com)