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EMERGING PEST SCENARIO IN RICE IN INDIA

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Rice is the most important food crop in India and on research, and production priority for national food security. Since the onset of green revolution in the country, there has a constant increase in the number of insect and non-insect pests like mites and nematodes, and also a concomitant shift in their pest status/intensity, diversity, and spread in rice. The major factors that have contributed towards changes in the pest scenario are extensive cultivation of high yielding varieties, growing of varieties lacking resistance to major pests, intensified rice cultivation throughout the year providing constant niches for pest multiplication, imbalanced use of fertilizers, particularly application of high levels of nitrogen, non-judicious use of insecticides resulting in pest resistance to insecticides, and resurgence of pests and out breaks of minor pests (SAIN and PRAKASH, 2008; PRAKASH *et al.*, 2014)

Insect pests

Among the major insect pests, stem borers [yellow stemborer-YSB (*Scirpophaga incertulas*), white stemborer-WSB (*Scirpophaga innotata*), pink stemborer-PSB (*Sesamia inferens*), striped stemborer-SSB (*Chilo polychrysus*), dark-headed stemborer-DHSB (*Chilo suppressalis*)] have shown geographical variation in their species composition and occurrence across the country. Though, YSB is the dominant species, WSB and PSB have made inroads in hill regions, parts of Punjab and Haryana in northern India and Kerala in southern region (PRAKASH *et al.*, 2005). At Ludhiana (Punjab), WSB, PSB & YSB occurred at equal proportion during maximum tillering phase; during flowering stage the YSB was the dominant and almost 90% attack was due to PSB during dough stage. Similarly at Kaul during kharif 2005, the YSB was dominant in maximum tillering; but PSB & YSB were equal in heading stage. At Titabar (Assam), WSB was dominant during tillering stage and maximum tillering stage. In Odisha, YSB is the dominant during both vegetative & heading stages during dry season. At Wangbal, YSB remained dominant throughout the season, though at heading stage WSB was about 30% of the composition (SAIN and PRAKASH, 2008). YSB reported to be serious pest in about 15000 ha in Chinsura, Hoogly district (West Bengal) causing white-ear heads from 15-90% during boro (Janaury-May) *rabi*-12.

Rice gall midge, *Orseolia oryzae* remained a key pest with wide spread up to 1990s and emergence of six biotypes, causing serious losses in new areas like Bihar and North Eastern state of Manipur in addition to traditional areas of Odisha, Andhra Pradesh, Madhya Pradesh and Kerala. Currently this pest is a minor & sporadic restricted only in few rice growing pockets in Manipur & Andhra Pradesh (PRAKASH, 2013).

The delphacid planthoppers *viz.*, brown planthopper, *Nilaparvata lugens* and white-backed planthopper, *Sogatella furcifera* have emerged as serious pests in many rice growing states round the year. During the *Kharif* -2008. There was a severe

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infestation of these hoppers in Punjab and Haryana in about 120, 000 ha. These have been a regular pest in the East & West Godavari districts in Andhra Pradesh and Bellary and Sindanur areas in Karnataka and in Burdwan district of West Bengal during *kharif*-2009-12 (PRAKASH *et al.*, 2014).

Leaf folder, is another pest of minor significance earlier, has assumed major pest status in the entire country particularly in areas of high fertiliser use. This pest has three species *viz.*, *Cnaphalocrocis medinalis*, *Marasmia patnalis* and *M. exigua*, of which *C. medinalis* is dominant and wide spread. There are also other pests of regional significance such as hispa, gundhi bug, mealy bug, termite, white grub and caseworm (BEHERA *et al.*, 2013).

The cutworms are becoming serious in many rice growing areas in the eastern part of the country. For last few seasons, the climbing cutworm, *Mythimna separata*, has been regularly occurring in coastal Andhra Pradesh and in the Eastern States. Similarly, the swarming caterpillar, *Spodoptera mauritia* has acquired a status of major pest in Odisha, Bihar and Jharkhand during *kharif*-2007-09, 2012, 2013 and devastated paddy crop in early stage in considerable areas (PRAKASH *et al.*, 2014).

Rice hispa, *Dicladispa armigera*, a coleopteran pest is problem in specific rice ecologies *viz.*, irrigated paddy fields as well as lowland boro rice cultivation in West Bengal, Assam and North-East Indian states. Termites (white ants) and gundhi bug are major insect pests in upland rice ecology. White grubs are problem in specific upland hill rice, whereas in deep water ecology, only the stem borers and in semi-deepwater ecology stem borers, caseworms and hispa are the key insect pests (PRAKASH, 2013).

Mite pests

Rice panicle mite, *Steneotarsonemus spinki* Smiley found to be an emerging pest infesting paddy fields in India especially at flowering stage when temperature ranged 26-30 °C and relative humidity above 80%, Its incidences in India have been reported from Andhra Pradesh and West Bengal, more severe during September and October where congenial conditions of temperature and humidity prevailed, resulting considerable yield losses in term of sterility (20-50%) in rice (RAO *et al.*, 1999; RAO and PRAKASH, 2003). Recently out-break of the panicle mites is reported in about 30,000 Ha farmers paddy fields in districts Balasore, Bhadrak, Puri, Ganjam, Gajapati and Kedrapada districts of Odisha (DHARITRI, 2 November, 2014). Rice leaf mite, *Oligonychus oryzae* is also emerging as important mite pest in irrigated and upland rice especially in the roadside fields for last few years.

Nematode pests

Rice root-knot nematode, *Meloidogynae graminicola* has become a major pest in aerobic rice cultivation in the recent years (2009-2013), though this was earlier a pest of upland rice in eastern India (MISRA, 2008). Ufra disease caused by nematode, *Ditylechus angustus* has been found increasing in its spread in Assam and West Bengal.

Rice diseases

In rice, several diseases *viz.*, rice blast (*Pyricularia grisea*), brown spot (*Helminthosporium oryzae*), sheath blight (*Rhizoctonia solani*), false smut (*Ustilaginoidea virens*), sheath rot (*Sarocladium oryzae*), seedling blight (*Sclerotium oryzae*), bakanae (*Fusarium moniliformae*), bacterial blight (*Xanthomonas oryzae* pv. *oryzae*), bacterial grain and seedling rot (*Burkholderia glumae*), and tungro (rice tungro bacilliform virus and rice tungro spherical virus), do occur, resulting in significant damage to the grain and straw yield in India.

Among the rice diseases, blast and bacterial blight still considered as major diseases. False smut has emerged as an important diseases for about last one decade and its' out-break has been reported in Chhatisgarh during *kharif*-2007 in about 6000 ha. This disease is now widespread in Odisha and infects panicles in field rice especially dominant variety like Pooja. Sheath blight and sheath rot have also emerged again as major diseases for last 6-8 years in eastern India.

Rice tungro, a vector (GLH) born disease, was a major viral disease in eastern India during 1980s, 1990s but now restricted to only Assam and in few pockets in West Bengal. In Punjab & Haryana, Bakane disease of rice has emerged as major problem in export scented rice (Pusa Basmati 1121) and reported to infect about 20,000 ha during *kharif*-2011. Sheath rot disease is again emerging important disease in rainfed lowland ecology and generally associated with incidences of rice mites. Another seed borne disease, seedling blight caused by *Sclerotium oryzae* is severely damaging rice production especially scented rice varieties and during *kharif* 2014 severe damage of seedlings has been recorded in Haryana (PRAKASH *et al.*, 2014).

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