

## Cost of Plant Introduction—The Expanding Horizons of Crop Diseases

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The number of diseases which moved inadvertently to new ecological regions from their original habitats have increased over the years due to the increased mobility of men and materials. In spite of the stringent regulations and considerable investments to prevent entry of Karnal bunt pathogen of wheat, caused by *Tilletia indica*, in to USA, the organism was detected in about 25 years of its detection in Mexico, indicating inadequacy of the quarantine efforts. This calls for an introspection. Subsequently relaxation of the minimum quarantine specifications were considered, but nevertheless “expanding horizons of plant pathogens remain a reality”. There is need to look at the plant introduction and its consequences objectively on a long term basis and beyond disease free materials. Because when virgin disease free planting material is considered for planting, at times it may become more susceptible due to absence of resistance against indigenous pathogens. When introductions are made through germplasm exchange, the materials, which are susceptible, are likely to get eliminated with respect to the major disease problems. However minor diseases which are not considered for screening and testing were later found to have assumed significance. The consequences of large scale introduction of disease free exotic material and their introgression in to new cultivars in the breeding programme since last 40 years in India and rest of the world, has resulted in converting many minor endemic organisms in to major disease problems. This situation was well illustrated with rice and wheat crops in India, where number of “minor diseases like Karnal bunt and leaf blights in wheat and BLB, sheath rot, sheath blight, false smut and brown spot in rice and grain discolourations in both have assumed significance”, after the new dwarf varieties were released for cultivation in the farmers field since 1960’s,

further adding to the cost of their management. The domains of these organisms have increased, further aggravating the situation, because here is no control on seed trade and retailing of the seeds of new cultivars and their movement in to unscheduled regions with in the country. The pathogens like *T. indica*, which were endemic to the foot hills of north India, colonized all the niches in the north western plain zone. There fore, along with preventing the introduction of exotic pathogens. the possibility of the indigenous pathogens becoming severe also needs to be taken care of. As the subsequent flare ups and spread of indigenous pathogens adds to the cost of plant introduction many folds. This needs to be considered in future, to prevent recurring cost to sustainability. Risk for this will aggravate with trade in agricultural commodities assuming global proportions. Therefore along with implementation of quarantine at the international level, there was need to (a) revoke domestic quarantine, (b) devise legislative measures to check indiscriminate sale and spread of seed varieties in the unscheduled regions in the domestic market to arrest ever expanding domains of endemic pathogens and (c) Screening efforts to test the new materials against minor pathogens also need to be taken care of, considering the extent of economic damage the Karnal bunt caused to the surplus wheat from north western plain zone of India. A delayed domestic quarantine against flag smut of wheat had cost USA the wheat trade with China from early nineteenth century till fifties. Since increased movement of agricultural produce in future will entail increased spread of pathogens, therefore “preventive” (i) international as well as (ii) domestic measures are equally important to reduce the cost of plant introduction and contain ever expanding horizons of plant pathogens.