Yield loss due to *Alternaria* blight in rapeseed-mustard and integrated approaches for its management

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Quantitative relationships between yield of mustard (*Brassica campestris* cultivar BINA2) and disease parameters of *Alternaria* blight caused by *Alternaria brassicae* were studied in five trials (four in 1997/98 and one in 1998/99) conducted under natural conditions in Bangladesh. The intensity of *Alternaria* blight was characterised as disease severity of leaves (DS), disease incidence of siliqua (DIS) and number of spots per siliqua (SS). DS was very strongly or strongly related to DIS. For the pooled data of the four trials in 1997/98, yield (Y) measured as seed weight in g/m^2 was linearly related to DS (assessed at 65 days age growth stage). Histopathological studies revealed that moderately thickened small sized cells of inner cortex are less affected and xylem vessels are not at all attacked by *A. brassicae* and thus the invasion by *A. brassicae* is non-systemic. Healthy and less affected stems and siliqua of mustard contain higher amount of ascorbic acid, sugars and phenols than plant organs severely infected. As variety BINA2 possesses those anatomical features and biochemical properties, it is regarded as tolerant to *A. brassicae.* Crops sown in Bangladesh before November 5 can escape *Alternaria* blight. Incorporation of cow dung and gypsum into soil during land preparation proved promising in reducing disease severity. Use of apparently healthy seeds, weeding and application of insecticide and fungicide had their individual effects on reducing blight severity and improving yield. Integration of highest level of management, i.e. apparently healthy seeds, one weeding, 2 sprays of insecticide and 2 sprays of fungicide, reduced *Alternaria* blight severity by 92% and increased seed yield by 276% (net yield 2.0 t/ha). Considering the cost involvement and farmers attitude in Bangladesh, integration of apparently healthy seeds of Variety BINA2, one weeding at 30 days crop age, one spray of Malathion 57EC (0.02%) and one spray of Rovral 50wp (0.02%) at 55 days age of the crop is recommended to secure an increase of seed yield by 231% through reducing the disease index by 77% and siliqua infection by 50% (benefit/cost ratio 4.92).