



Different practices for management of White rust (*Albugo candida*) of Mustard (*Brassica juncea*)

Nilesh Kumar Sahani^{1*}

Abstract:

White rust of mustard caused by *Albugo candida* is the most disastrous disease in all mustard-cultivated countries. Spinach, horseradish, and mustard are affected more seriously than other crucifers. Symptoms. White rust produces small white pustules on the undersides of affected leaves. The pustules may enlarge and grow together to form larger, irregularly shaped lesions filled with white spores.

Keywords: Mustard, Symptoms, White rust, *Albugo candida*, Management

Introduction:

White rust, caused by the oomycete pathogen *Albugo candida*, is an important disease of cruciferous vegetable (Williams and Pound 1963) and oilseed crops (Harper and Pittman 1974; Fan et al. 1983; Edwards and Williams 1987). Of the susceptible oilseed crops, many *Brassica juncea* (mustard) varieties are highly susceptible to white rust (Mukherjee et al. 2001; Delourme et al. 2011). On susceptible *B. juncea* varieties, *A. candida* infects all aboveground parts, producing characteristic white blisters on cotyledons, leaves, stems and inflorescences; while infection of inflorescences results in development of swollen hypertrophies and/or twisted inflorescences commonly known as ‘stagheads’.

In relation to infections of shoot tissues, it is the inoculation of the growing point at the first true leaf stage that leads to systemic development of the disease (Kaur et al. 2011b). Stagheads develop from (i) infections of flower buds just before a change in their colour or (ii) when flowers are opening, but not with earlier stages of flower bud development or senescing flowers (Kaur et al. 2011b). Development of stagheads is considered the main cause of yield loss in susceptible varieties (Verma and Petrie 1980) and yield losses of up to 60% or more have been reported in India on *B. rapa* and *B. juncea* (Lakra and Saharan 1989) and up to 20% losses in Australia (Barbetti 1981; Barbetti and Carter 1986).

Nilesh Kumar Sahani^{1*}

¹Ph.D. (Agriculture), Department of Plant Pathology,
Banda University of Agriculture and Technology, Banda

Symptomatology:

White rust produces small white pustules on the undersides of affected leaves. The pustules may enlarge and grow together to form larger, irregularly shaped lesions filled with white spores. The upper surface of affected leaves shows a distinct mosaic pattern. Sometimes the disease results in clublike swellings on roots, and inflorescence become large in size cause of hypertrophy and hyperplasia (stigma & anthers).

Disease Cycle:

White rust is caused by a fungus that overwinters in midwestern soils as thick-walled, weather-resistant spores. The overwintering spores germinate in the spring and infect young seedlings. As disease development progresses, the pathogen produces other spores in pustules on the undersurface of leaves. The spores may become airborne and spread to other plants and fields.



(a)



(b)



(c)



(d)



(e)

Note- a, b) White postule of *Albugo candida*, lower side of the leaf, c) Affected of stigma, d) Affected of anther, e) Hypertrophy of stem

Overwintering spores are produced in decaying crop debris and released into the soil.

Disease management:

1. Cultural management:

➤ The strategy for white rust control involves reducing the pathogen population in the field. This may be accomplished through procedures such as rotation out of cruciferous crops, fall plowing, and good weed control. Protective fungicides are available for use on only a few crops. White rust-resistant varieties are not available.

2. Biological management:

➤ Seed treatment and soil application of *Trichoderma* species along with fungicidal spray was found to be effective against different pathogens of crop plants.

➤ Copper oxychloride @ 0.25% + *T. viride* treated plot recorded less stag head incidence (1.3%). (Gopi, R., *et al*, 2016).

3. Chemical management:

➤ Seed treatment in combination with two sprays of early spraying (20 and 35 OAS) of mancozeb and ridomil MZ-72 was found less effective in comparison to later sprays (45 and 60 OAS) of the same. (VA, A. B., *et al*, 1997)

➤ Chlorothalonil 75 WP, both sprays of early 20 and 35 OAS and late 45 and 60 OAS were found statistically at par in their

efficacy having POI 21.4 and 20.8 respectively. (VA, A. B., *et al*, 1997)

➤ The most effective treatment was seed treatment with metalaxyl SO-35 + three early sprays of chlorothalonil 75 WP (20, 40 and 60 DAS) having POI 16.8 0, although chlorothalonil 75 WP was found less effective in case of stag-head condition. (Kapoor and Sugha, 1995).

Conclusion:

Albugo candida one of most important disease of mustard that affect of mustard at economic level. So many practices for management of white rust like cultural, biological and chemicals but most satisfactory management is biological management that also helps of environment to clean and fresh. Cultural practices like crop rotation etc. that brakes life cycle of the pathogen. Chemicals are help to management of pathogen but they are adverse effect on environment and soil microorganisms.

References:

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