



# INTEGRATED DISEASE MANAGEMENT OF ALTERNARIA BLIGHT OF RAPESEED-MUSTARD

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## ABSTRACT

**Seed treatment and its integration with foliar spray were found effective in reducing disease severity and increased seed yield of rapeseed-mustard crop. Application of Carbendazim as seed treatment and its combination with foliar spray of Ridomil-MZ was found most effective in reducing disease severity of Alternaria blight of mustard showing 17.2% at leaf and 9.1% at pod which was followed by T-7 i.e. seed treatment with garlic extract and foliar spray of Garlic extract (4% w/v) recorded 19.5% disease severity at leaf stage, respectively. As per yield is concerned, seed treatment and its integration with foliar spray of fungicides and biocides are able to enhance seed yield significantly over the control. The highest seed yield with 1719 kg/ha was obtained with application of carbendazim (ST) and foliar spray of Ridomil MZ 72 (T-9), followed by ST with Metalaxyl and foliar spray with Ridomil (T-8) (1719 kg/ha).**

**Key Words :** Seed treatment, Alternaria blight, fungicides, disease severity, Rapeseed and mustard.

Rapeseed and mustard is an important oil seed crop in India as well as in the world. India occupies a premier position in global oilseeds scenario. It is cultivated in 26 states in northern and eastern plains of the country namely Rajasthan, Uttar Pradesh, Haryana, Madhya Pradesh and West Bengal which contribute together 83.57% in acreage and 86.99% in production of the country. The productivity level of the rapeseed mustard in India is only 1148 kg/ha which is very low as compared to the world average of 2593 kg/ha (Anonymous 2007). The main reason of low productivity in India is due to pests and diseases. Among them, diseases are most important as they cause yield losses ranging from 10-70 per cent. In India, more than twenty diseases caused by fungi, bacteria, virus,

phytoplasma and nematode have been reported to affect rapeseed-mustard group of crops. However, only few of them *viz.*, Alternaria blight, white rust, *Sclerotinia* rot and powdery mildew are considered major diseases which causes major economic yield losses in the country. Alternaria blight of rapeseed-mustard caused by *Alternaria brassicae* (Berk.), Sacc. is a severe and destructive one that causes adverse affect on both quality and quantity of the crop. The disease was first reported by Dey (1948) at Kanpur in Uttar Pradesh, which caused yield loss up to 35-45% in mustard under normal condition (Kolte, 1996), but the extent of losses can be up to 70% under favorable condition (Chahal and Kang, 1981).

## MATERIALS AND METHODS

The experiment was conducted at Experimental Research Farm, Chandra Shekhar Azad University of Agriculture and Technology, Kanpur during the *rabi* season of 2009-2010 and 2010-11 under natural condition. The recommended agronomic practices were adopted for raising a good crop.

### Integrated disease management

The experiment was conducted at Oilseed Research Farm, Kalyanpur, Chandra Shekhar Azad University of Agriculture and Technology, Kanpur during *rabi* season 2009-2010 and 2010-11. The susceptible variety “*Varuna*” was sown at spacing 30 x 10cm between row and plant in 3m x 5m plot size. All recommended agronomical practices were adopted during the crop period. Eleven treatments of different combination of fungicide and bio-agent as seed treatment alone or in combination with foliar spray by garlic extract, bio-agents and fungicide were given in order to reduce disease severity of *Alternaria* blight in mustard. The details of treatments were given as T1- Garlic bulb extract @ 1% w.v Seed Treatment (ST), T2- metalaxyl

@ 6.0g/kg (ST), T3- (Carbendazim @ 1g a.i. (ST), T4- Apron 35 SD @ 6g/kg+ carbendazim @ 1g a.i. (ST), T5- *T. harzianum* @ 10g/kg (ST), T6- *T.Harzianum*@ 10g/kg (ST) +*P. fluorescens* @ 10g/ Kg (ST), T7-Garlic bulb extract@ 1% w/v (ST)+ Garlic extract@ 1% as Foliar Spray (FS), T8-Metalaxyl @ 6g/ kg + Ridomil MZ 72 @ 2g/l (FS), T9-Carbendazim @ 2g/kg (ST)+ Ridomil MZ WP 2% (FS), T10 - *T.harzianum* (ST)+*T. harzianum* (FS). T11 - Control.

For the preparation of garlic bulb extract, take 20 g of garlic bulb and crush in warning blender. The extract was diluted in adding require quantity of water and made 1% solution. The extract is to be prepared afresh on the day for seed treatment or foliar application and is to be applied immediately after preparation. Bio-agents were collected from G.B. Pant University of Agriculture and Technology, Pantnagar and moistened seeds of variety (*Varuna*) were treated with the bio-agents @ 4g/kg of seed and treated seeds were shade dried before sowing.

## RESULTS AND DISCUSSION

The data presented in the Table-1 revealed that all the treatments were able to minimum the severity

**Table 1 : Effect of fungicides, bio-agent, botanicals alone or in combination against *Alternaria* blight and yield of mustard. (Pooled data of 2009 -2010 & 2010-2011)**

Treatment	Disease severity of <i>Alternaria</i> blight on leaves. ( % )	Disease severity of <i>Alternaria</i> blight on pod. ( % )	Yield (kg/ha)
T <sub>1</sub>	3.1(25.2)	28.8(23.3)	1494
T <sub>2</sub>	38.2(38.2)	28.8(23.5)	1296
T <sub>3</sub>	41.0(43.2)	27.7(21.7)	1375
T <sub>4</sub>	41.3(43.6)	29.2(23.9)	1460
T <sub>5</sub>	36.6(33.1)	31.6(27.6)	1401
T <sub>6</sub>	38.1(39.8)	34.7(32.5)	1415
T <sub>7</sub>	26.1(19.5)	26.2(22.5)	1510
T <sub>8</sub>	26.6(20.7)	19.6(11.7)	1667
T <sub>9</sub>	24.4(17.2)	17.4(9.1)	1719
T <sub>10</sub>	37.0(36.4)	3.6(26.1)	1468
T <sub>11 control</sub>	53.1(63.9)	45.0(51.1)	1209
CD 5 %	5.105	5.193	0.018
CV	8.42%	10.39%	5.75%

of disease. The minimum disease severity with 17.2% at leaf and 9.1% at pod were recorded in T-9 management where seeds were treated with Carbendazim and foliar spray with Ridomil MZ WP 2% which was followed by T-7 i.e. seed treatment with garlic extract and foliar spray of garlic extract (4% w/v), showing 19.5% disease severity on leaf and 22.5% at pod stage. The application of *Trichoderma harzanium* as seed treatment and foliar spray was found superior over control to reduce disease severity by 25.2% and 23.3% at the leaf and pod stage, respectively.

As per yield is concerned, data presented in the table 1 revealed that seed treatment and its integration with foliar spray of fungicides and biocides are able to enhance the seed yield significantly over the control. The highest seed yield with 1719 kg/ha was obtained with application of Carbendazim (ST) and foliar spray of Ridomil MZ 72 (T-9), followed by ST with Metalaxyl and foliar spray with Ridomil (T-8) (1719 kg/ha). Seed treatment with garlic extract and foliar spray with garlic extract also gave 1510 kg/ha. Which is third highest among the treatments Patni *et al.* (2005) reported that application of plant extracts significantly reduced *Alternaria* blight intensity and also increased the test weight and yield. Prasad and Lallu (2006) have also reported similar observation in terms of seed yield, seed weight and per cent reduction in disease by spray of fungicides and garlic extract in mustard crop.

Similarly, Noon *et al.* (1988) reported that elutriator based formulation containing

Carbendazim is effective against stem rot of oilseed crop and also give significant higher yield. From the present finding, it may be concluded that seed treatment and its integration with foliar spray were found significantly effective in reducing disease severity and increased seed yield of rape seed and mustard crop.

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