

MANAGEMENT OF LEAF SPOT (*SEPTORIA OBESA*) OF CHRYSANTHEMUM BY FUNGICIDES AND BIOFORMULATION

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Abstract: Leaf spot disease has become an important constraint for chrysanthemum cultivation in Himachal Pradesh. Field experiments were carried out during rainy season of 2011-12 & 2012-13 to assess the efficacy of fungicides & bioformulations. Metiram was found best with 95.9 per cent reduction in disease index followed by SAAF & Quintal with reduction of 94.0 per cent each. Between two bioformulation, Field Formulation was more effective with 81.3 per cent reduction in disease index in comparison to 80.3 per cent reduction with Neemazal.

Keywords: *Septoria obesa*, leaf spot, chrysanthemum, fungicides, biopesticides.

Introduction

Septoria leaf spot disease of chrysanthemum sp. has a wide geographical distribution, including the Asian and European continents as well as the western hemisphere. Chrysanthemum is one of the most important ornamental flower crops grown. It is used and enjoyed for most part as cut flowers. Two species of *Septoria*, *Septoria chrysanthemella* Sacc. and *S. obesa* Synd. are frequently observed to induce leaf spots. The spotting of the foliage detracts from the quality and salability of the cut flowers and tends to reduce the quantity and quality of the blooms (Kumar et al. 2008; Koike & Wilen 2009). The disease was recorded upto 45 percent in Solan district (Chandel & Ram, 2009). Therefore, looking into the severity of the disease and economic importance of crop, some fungicides and bioformulations were evaluated for the management of leaf spot of chrysanthemum.

Materials and Methods

Effect of different fungicides and bioformulation on disease incidence of *Septoria* leaf spots (*Septoria obesa*), yield and quality of flowers

Field evaluation was carried out using a chrysanthemum variety Poornima during 2011-12 and 2012-13 at Research Farm of the Department of Plant Pathology, Dr. Y S Parmar University of Horticulture and Forestry, Nauni, Solan. The experiment was laid out in a randomized block design consisting of 10 treatments each with three replications. Rooted

cuttings were planted in the month of July-August at a planting distance of 1m ×1m. The spray schedule was started after the onset of the disease under natural epiphytotic conditions.

RESULTS AND DISCUSSION

TABLE 1. Effect of different fungicides and bioformulation on disease incidence of Septoria leaf spots (*Septoria obesa*), yield and quality of flowers (2011-12)

Treatment (Dosage in %)	Disease Index (%)	Number of flowers/m ²	
		A Grade	Total
Bavistin (0.05)	13.6 (21.64)	21.0	34.3
Cabriotop (0.2)	9.8 (18.22)	25.6	36.0
Contaf (0.05)	6.9 (15.25)	24.6	39.3
Indofil M-45 (0.25)	9.3 (17.63)	24.0	38.3
Saaf (0.20)	5.0 (12.95)	25.0	41.3
Metiram (0.2)	3.4 (10.72)	25.3	43.0
Quintal (0.2)	5.0 (12.95)	25.3	42.3
Neemazal (1.00)	16.5 (23.96)	24.3	37.0
Field Formulation (10.0)	15.7 (23.36)	26.0	39.6
Control	84.0 (66.53)	0.6	9.0
CD (0.05)	3.31	3.06	3.28

*Figures in parentheses are angular transformed values

In chrysanthemum, Septoria (*S. obesa*) leaf spot is a serious problem affecting the foliage of the plant. Experiment was conducted in the field for the management of the diseases in natural disease pressure on Poornima variety. Seven chemical pesticides were evaluated against the disease and Metiram was found the best with 95.9 per cent reduction in disease index followed by SAAF and Quintal with reduction of 94.0 per cent each and all were found statistically at par (Table 1). Between two bio-pesticides, Field Formulation was found more effective with 81.3 per cent reduction in disease index in comparison to 80.3 per cent reduction with Neemazal. Metiram and SAAF were found effective with highest flower yield of 43/m² which was 377 per cent higher than control. Spray with Metiram and Quintal also resulted in better quality of flowers with 42.1 times higher A-grade flowers.

Table 2. Effect of different fungicides on the disease incidence of *Septoria* leaf spots (*S. obesa*), yield and quality of flowers (2012-13)

Treatment (Dosage in %)	Disease Index (%)	Number of flowers/m ²	
		A Grade	Total
Contaf (0.05)	5.50 (11.82)	32	42
Indofil M-45 (0.25)	10.18 (15.32)	24	36
Saaf (0.20)	4.2 (11.68)	33	43
Metiram (0.2)	2.8 (5.84)	35	45
Quintal (0.2)	6.9 (12.49)	27	40
Field Formulation (10.0)	13.9 (21.95)	23	36
Control	75.5 (60.34)	4	11
CD (0.05)	2.81	2.6	4.3

*Figures in parentheses are angular transformed values

On the basis of earlier experiments, five chemical pesticides and one botanical formulation were evaluated against the disease on Poornima variety. Metiram was found the best with 96.2 reduction in disease index followed by SAAF and Quintal with reduction of 94.4 and 90.8 per cent, respectively (Table 2). Botanical formulation (Field Formulation) was also found more effective with 81.5 per cent reduction in comparison to control. Treatment with spray of Metiram was found most effective with highest flower yield of 45/m² which was 309 per cent higher than control. Spray with Metiram also resulted in better quality of flowers with 775 per cent higher A-Grade Flowers. The evidence of the field efficacy of these fungicides has been given by various workers in controlling different species of *Septoria* (Bates 2005 & Lambe 2009). Rajugopal and Vidyasekharan (1986) reported mancozeb, captafol and carbendazim effective against *Septoria lycopersici*. Zhang & Li (1986) also reported reduction in disease caused by *Septoria chrysanthemella* by use of captafol and carbendazim. Ahmad & Ahmad (2000) evaluated carbendazim, thiophanate methyl & captan against *Septoria* leaf spot disease and reported their superiority over other fungicides. Chandel (2003) recorded maximum disease control in case of contaf, saaf and roverol against *Septoria* leaf spot of chrysanthemum. Raudales and McSpedden-Gardena (2008) used microbial biopesticide for the control of *Septoria* diseases in tomato in organic farming.

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