

RELATIONSHIP BETWEEN INCIDENCE AND SEVERITY OF ALTERNARIA BLIGHT DISEASE ON DIFFERENT SPECIES OF *BRASSICA* IN GONBAD REGION *

M. GHASEMI ¹, M. A. AGHAJANI ^{2**}, A. FARAJI ² and M. R. SAIDI NEJAD ¹

(Received : 12.7.2011; Accepted : 15.10.2012)

Abstract

Alternaria blight disease, caused by *Alternaria* spp., damages severely to oil-producing species of *Brassica* spp. all over the world and reduces the quality and quantity of the oil. To determine the relationships between incidence (*I*) and severity (*S*) of Brassica blight disease, and making a model for predicting *S* based on *I* values, this research was performed on two genotypes of mustard (j-98-102/51-5 and Bard-1), two genotypes of turnip (Rainbow and Candle), three genotypes of canola (Hayola401, Shiralee and RGS003) and genotype Select 4 (fourth generation of rapeseed-mustard cross) in agricultural research station of Gonbad, Iran as a completely randomized block design in three replications. Severity of disease in the specified time intervals was measured until the appearance of withdrawal symptoms. Results showed that the Allometric model (natural logarithm transformation of *I* and *S*) with about 66 % of R^2 had the best fitting for the collected data and therefore it was the best model to describe *I-S* relationships in Alternaria blight of *Brassica* spp. Based on the regression slope of Ln transformed values of *I* and *S*, the genotypes were classified in 3 groups. The first group includes Bard-1 genotype with high slope (1.48). Candle, Select4 and RGS003 were placed in the second group with moderate slope (1.25) and the third group was included genotypes Rainbow, Shiralee and J-98 with the least slope (1.15).

Keywords: Canola, Indian mustard, Turnip, Alternaria blight, *I-S* relationships.

See Persian text for figures and tables (Pages ۵۱-۶۰).

*: A Part of MSc. Thesis of the First Author Submitted to Islamic Azad University, Damghan Branch, Damghan, Iran.

** : Corresponding Author, Email: maaghajani@yahoo.com

1. MSc. Students of Plant Pathol., Islamic Azad University, Damghan Branch, Damghan, Iran.

2. Assis. Prof.s of Plant Pathol., Agriculture and Natural Resources Research Center of Golestan Province.

References

- AGHAJANI, M. A., SAFAI, N. and ALIZADE, A. 2009. Easy and Accurate assessment of Sclerotinia stem rot of canola. **J. Agric. Sci. Nat. Resour.** 15: 217-225.
- ANONYMOUS. 2010a. Agriculture Statistic. Vol. 1. Field crops. Year 2009-2010. Ministry of Jihad-e-Agriculture, Programming & Economics Adjutancy, Department of Statistics & Information Technology.
- BHOWMIK, T. P. 2003. **Oilseed Brassics**. Darya Ganj. New Dehli, India.
- CAMPBELL, C. L. and MADDEN, L. V. 1990. **Introduction to Plant Disease Epidemiology**. John Wiley and Sons, New York.
- CARDOSO, J. E., SANTOS, A. A., ROSSETTI, A. G. and VIDAL, J. C. 2004. Relationship between incidence and severity of cashew gummosis in semiarid North-eastern Brazil. **Plant Pathol.** 53: 363–367.
- CHUANG, T.Y. and JEGER, M.J. 1987. Relationship between incidence and severity of banana leaf spot in Taiwan. **Phytopathology** 77:1537-1541.
- GHASEMI, M., AGHAJANI, M. A. and FARAJI, A. 2011. Investigation of resistance to Alternaria blight in Brassica spp. in Gonbad region. **3rd Intl. Seminar on Oilseeds and Edible Oils, Tehran, Iran.** 310 (Abst.).
- GUAN, J. and NUTTEER, F.W.J. R. 2003. Quantifying the interrater repeatability and interrater reliability of visual and remote-sensing disease-assessment methods in the alfalfa foliar pathosystem. **Can. J. Plant Pathol.** 25:143-149.
- HUGHES, G., MCROBERTS, N., MADDEN, L.V. and GOTTWALD, T.R. 1997. Relationships between disease incidence at two levels in a spatial hierarchy. **Phytopathology** 87:542-550.
- JAMES, W.C. 1971. A Manual of Disease Assessment Keys for Plant Diseases. **Canadian Dept. of Agricultural Pub. , CA.**
- JURKE, C.J. and FERNANDO, W.G.D. 2008. Effects of seeding rate and plant density on sclerotinia stem rot incidence in canola. **Arch. Phytopat. Plant Protec.** 41:142-155.
- KOLTE, S.J. 1985. Diseases of Annual Edible Oilseed Crops. Vol. II, Rapeseed-Mustard and Sesame Diseases. **CRC Press Inc., Boca Raton, Florida.**
- KUMAR, B. and KOLTE S.J. 2001. Progression of Alternaria blight of mustard in relation to components of resistance. **Ind. Phytopathol.** 54: 329-331.
- MCCARTNEY, H.A., LACEY, M. E., Li, Q. and HERAN, A. 1999. Airborne ascospore concentration and the infection of oilseed rape and sunflowers by *Sclerotinia sclerotiorum*. **In: 10th Intl. rapeseed Cong., Canberra, Australia, 430 (Abst.).**
- MCROBERTS, N., HUGHES, G. and MADDEN, L.V. 2003. The theoretical basis and practical application of relationships between different disease intensity measurements in plants. **Ann. Appl. Biol.** 142:191-211.
- MEENA, P. D., AWASTHI, R. P., CHATTOPADHYAY, C., KOLTE, S. J. and KUMAR, A. 2010. Alternaria blight: a chronic disease in rapeseed-mustard. **J. Oilseed Brassica** 1: 1-11.
- NUTTER, F. W. J. 2001. **Disease Assessment**. Pp:312-323. **In: O. C. Maloy and T. D. Murray (Eds.), Introductory Encyclopedia of Plant Pathology, John Wiley & Sons Inc.**
- PAUL, P. A., LIPPS, P. E. and MADDEN, L. V. 2005. Relationship between visual estimates of Fusarium head blight intensity and deoxynivalenol accumulation in harvested wheat grain: A meta-analysis. **Phytopathology** 95:1225-1236.
- SANGEETHA, C. G. and SIDDARAMAIAH. A. L. 2007. Epidemiological studies of white rust, downy mildew and Alternaria blight of Indian mustard (*Brassica juncea* (Linn.) Czern. and Coss.). **Afr. J. Agric. Res.** 2: 305-308.
- SEEM, R.C. 1984. Disease incidence and severity relationships. **An. Rev. Phytopathol.** 22: 133-150.
- SHAH, S. J. A. and ALI, I. 2002. Effect of grey leaf spot on oil content of rapeseed and mustard. **Pakistan J. Sci. Indus. Res.**, 45: 6,412.
- SHRESTHA, S.K., MUNK, L. and MATHUR, S.B. 2005. Role of weather on Alternaria leaf blight disease and its effect on yield and yield component of mustard. **Nepal Agric. Res. J.** 6: 62-72.

- SINGH, A. and BHOWINK, T. P. 1981. Persistence and efficacy of some common fungicides against *Alternaria brassicae*, the causal agent of leaf blight of rapeseed and mustard. **3rd Intl. Sym. On Plant Pathol., New Dehli**, 70(Abst.).
- SINGH, D.N., SINGH, N.K. and SRIVASTAVA, S. 1999. Biochemical and morphological characters in relation to *Alternaria* blight resistance in rapeseedmustard. **Ann. Agric. Res.** 20: 472-477.
- SKORPAD, W. P. and TEWARI, J. P. 1977. Field evaluation of the role of epicuticular wax in rapeseed and mustard in resistance to *Alternaria* black spot. **Can. J. Plant Sci.** 56: 781.
- TEWARI, J. P. 1983. Cellular alterations in the blackspot of rapeseed caused by *Alternaria brassicae*. **Phytopathology** 73: 831.
- TWENGSTROM, E., SIGVALD, R., SVENSSON, C. and YUEN, J. 1998. Forecasting sclerotinia stem rot in spring sown oilseed rape. **Crop Protec.** 17: 405-411.
- VERMA, P. R. and SAHARAN, G. S. 1994. *Alternaria brassicae* (Berk.) Sacc., *A.brassicicola* (Schwein.) Wiltsh. And *A. raphani* Groves and Skolko:notes and bibliography. **Acta Phytopat. Entomol.**, 29: 283- 314.
- ZADOKS, J. C. 1985. The conceptual basis of crop loss assessment: The threshold theory. **Ann. Rev. Phytopathol.** 23:455-473.

Archive of SID