

Efficacy of Fungicides for Management of Phylostica Leaf Spot of Ginger *Zingiber officinale*

Zerhun Tomas* and Alamar Seid

Department of Plant Pathology, Southern Agricultural Research Institute, Areka Agricultural Research Center, P.O. Box 79, Areka, Ethiopia

Abstract

Ginger (*Zingiberofficinale*Rosc.) is an important spice crop grown in tropical and subtropical countries including Ethiopia. It is produced both for commercial and home use. In Ethiopia, more than 70 percent of the total ginger production is contributed from SNNPR especially Boloso-Bombe district of Wolaita and Hadaro-Tunto district of Kambata-Tambaro Zones. But, since 2012 the first ginger wilt disease epidemic was reported and ginger disease is becoming the threat of national ginger production as a whole. Therefore, the study was carried out to evaluate the effectiveness of fungicides for management of phylostica leaf spot disease of ginger. Five fungicides (Matco, Mancozeb, Redomil, Bordeaux mixture, dipping with Trust symocopp and Untreated) were evaluated for their efficiency to manage Phylostica leaf spot disease on one ginger variety (Boziab). The treatments were planted at Bombe and Areka using randomized complete block design (RCBD) with three replications with factorial arrangement in 2017. The response of treatments to ginger Phylostica leaf spot disease under natural infestation in terms of incidence and severity was recorded and the data was analyzed using SAS software (version 9.1). The result depicted that, number of finger per hill, average palm length, fresh weight of three hills and fresh weight of ginger per plot has no significant difference among fungicide sprayed treatments at Areka; however there was relatively significant difference of these parameters at Bombe on some Redomil and Matco sprayed treatments. However, there is quantitative variation among treatments, the result of disease severity showed statistically non-significant. Therefore, the alternative use of fungicides of Redomil and Matco can minimize ginger phylostica leaf spot disease and rhizome yield loss due to the disease.

Keywords: Ginger; Fungicides; Phylostica leaf spot; Incidence; Severity

Introduction

Ginger *Zingiber officinale* Rosc is an important spice crop grown in tropical and subtropical countries including Ethiopia [1]. It is produced both for commercial and home use. In Ethiopia, more than 70 percent of the total ginger production is contributed from SNNPR especially Boloso-Bombe of Wolaita Zone and Hadaro-Tunto of Kambata-Tambaro Zone [2]. But, since 2012 the first ginger wilt disease epidemic was reported and ginger disease is becoming the threat of national ginger production as a whole [3]. *Ralstonia solanacearum* biovar 3 is reported as the cause for the epidemic of ginger wilt in Ethiopia. Dake 1995 reported that, ginger is affected with about 24 diseases. Tomas et. al., 2020 also reported that ginger leaf spot caused by *Phyllostica zingiberi* as potential ginger production challenges in Boloso-Bombe district of Wolaita and Hadaro-Tunto district of Kambata-Tambaro Zones; in addition to *R. solanacearum* which was reported previously in different parts of the country. Therefore; the study was carried out to evaluate the effectiveness of fungicides for management of phylostica leaf spot disease of ginger [4].

Materials and Methods

The experiment was conducted at Areka and Bombe kebele of Wolaita zone during 2019 cropping season. The treatments included Matco 2.5kg/ha, Mancozeb 2.5kg/ha, Redomil 3kg/ha, Bordeaux mixture 1.81 kg/ha, Dipping with trust symocopp 1kg/200L Water (15min) and Untreated. Ginger variety “(Boziab)” was used for planting. The experimental was laid out randomized complete block design (RCBD) with three replications. All other agronomic practice kept constant except treatment. The response of treatments to phylostica leaf spot disease of ginger under natural infestation was taken in terms of incidence and severity and the data was analyzed using SAS software (version 9.1) and means were separated at 5% of level of significance.

Results and Discussion

In this study application of the Matco, Mancozeb, Redomil, Bordeaux mixture, Dipping with trust symocopp 15min and untreated were not have effect and were not significantly different in terms number of finger per hill, average palm length, fresh weight of three hills and Fresh weight of ginger per plot at Areka condition. But Matco and Redomil fungicides had significant effect and different in terms of finger per hill, average palm length, fresh weight of three hills and Fresh weight of ginger per plot at Bombe condition (Tables 1 and 2).

Table 1: Mean values of number of finger per hill, avpll= average palm length, fresh weight of three hills and Fresh weight of ginger per plot at Areka.

| Treatments | Nofp | Avpll | Fwhi | Fwgp |
|-----------------------------|---------|---------|---------|---------|
| Manozeb | 27.2 | 9.967 | 566.7 | 2633.3 |
| Redomil | 25.067 | 9.633 | 500 | 3000 |
| Matco | 26.633 | 8.633 | 466.7 | 3300 |
| Bordeaux mixture | 27.2 | 9.067 | 566.7 | 2933.3 |
| Dipping with trust symocopp | 25.2 | 8.867 | 500 | 2700 |
| Untreated | 25.400a | 9.2 | 450 | 2333.3 |
| CV (%) | 12.554 | 15.2817 | 37.7975 | 23.9656 |
| LSD | NS | NS | NS | NS |

Note: Nofp= number of finger per hill, Avpll= average palm length, Fw3hi=fresh weight of three hills, Fwgp=Fresh weight of ginger per plot and NS=no significant difference.

***Corresponding author:** Tomas Z, Department of Plant Pathology, Southern Agricultural Research Institute, Areka Agricultural Research Center, P.O. Box 79, Areka, Ethiopia, Tel: +251925708127; E-mail: zerhun_tomas@yahoo.com

Received: 01-Aug-2023, Manuscript No. acst-23-108923; **Editor assigned:** 03-Aug-2023, PreQC No. acst-23-108923 (PQ); **Reviewed:** 19-Aug-2023, QC No. acst-23-108923; **Revised:** 24-Aug-2023, Manuscript No. acst-23-108923 (R); **Published:** 31-Aug-2023, DOI: 10.4172/2329-8863.1000605

Citation: Tomas Z, Seid A (2023) Efficacy of Fungicides for Management of Phylostica Leaf Spot of Ginger *Zingiber officinale*. Adv Crop Sci Tech 11: 605.

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Table 2: Mean values of number of finger per hill, average palm length, fresh weight of three hills and fresh weight of ginger per plot at Bombe.

| Treatments | Nofp | AvpII | Fw3hi | Fwgp |
|-----------------------------|----------|-----------|----------|----------|
| Manozeb | 19.167b | 9.8667c | 450.00b | 4900.0bc |
| Redomil | 27.500ab | 11.3000b | 616.67b | 7866.7a |
| Matco | 31.433a | 13.7333a | 850.00a | 6900.0a |
| Bordeaux mixture | 16.200b | 11.3000b | 616.67b | 6200.0ab |
| Dipping with trust symoccap | 18.967b | 10.6333bc | 450.00b | 3633.3c |
| Untreated | 18.067b | 10.2000bc | 500.00b | 3666.7c |
| CV(%) | 26.73007 | 6.462074 | 17.34409 | 16.02364 |
| LSD | 11.71 | 1.444 | 201.4 | 1772 |

Note: Nofp= number of finger per hill, avpII= average palm length, Fw3hi=fresh weight of three hills and Fwgp=Fresh weight of ginger per plot .

Conclusion and Recommendation

Number of finger per hill, average palm length, fresh weight of three hills and fresh weight of ginger per plot has no significant difference among fungicide sprayed treatments at Areka; however there was relatively significant difference of these parameters at Bombe on some Redomil and Matco sprayed treatments. However, there is quantitative variation among treatments, the result of disease severity showed statistically non-significant. Therefore, the alternative use of

fungicides of Redomil and Matco can minimize ginger phylostica leaf spot disease and rhizome yield loss due to the disease. Future research should be directed towards frequency and time of application of Matco and Redomil for the better management of the phylostica leaf spot disease of ginger.

Acknowledgement

The Authors acknowledge Areka Agricultural Research Center and Southern Agricultural Research Institute (SARI) for the assistances during research period.

Competing Interest

Authors declare that they have no competing interests.

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