

Evaluation of Premise 25 FS (Triticonazole) to Control Seed and Seedling Damping-Off Diseases in Sesame

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ABSTRACT

The efficacy of Premise 25 FS (Triticonazole) in controlling damping-off diseases in sesame crop under rain fed conditions was evaluated at two locations, central and north Gedarif areas. The five tested rates of Premise 25 FS (3, 4.5, 6, 7 and 7.5 ml / kg seed), significantly increased percent seedlings emergence, reduced the incidence of post emergence damping off and increased sesame seed yield compared to the untreated control. However, Sesame seeds treated with Premise at the rate of 3 ml /kg seed, consistently and significantly enhanced seedling emergence (83.8 and 87.4%), reduced post emergence damping off (0.5 and 1.3%) and gave significantly higher yield (245 kg and 200 kg/ feddan) in both locations compared to other treatments

Keywords: *Sesame, damping –off, diseases, Premis25 FS*

1. INTRODUCTION

Sesame (*Sesamum indicum* L.) is grown in marginal and sub marginal lands. It is an important source of oil and protein. The quality and quantity of oil and protein is adversely affected by biological agents, which consequently influence the product manufactured by sesame seed or its derivatives. [2] reported detection of hyphal mat in the tissue and deletion of food content due to heavy infection of *F. oxysporium* in seed of sesame. Also the health of sesame plant is affected by fungi causing infection of root, foliage and seeds, for example transmission of seed-borne inoculums of *Macrophomina phaseolina* from seed to plant ([11]). The products and by-products of sesame have tremendous value. The sesame seeds oil content was found to be between 46 – 52% ([7]). In Sudan, sesame, is the most important oil seed for local consumption and export. The crop is subjected to attack by many seed and soil-borne pathogens at the seedling stage. These Pathogens include *Alternaria* sp., *Fusarium* sp., *pythium* sp. *Macrophomina* sp. *Rhizoctonia* sp etc., which cause reduction of seed germination, pre and post emergence seedling damping off ([7]; [3]). These pathogens may cause considerable losses in yield of the crop. Application of fungicides protects the plants growing from treated seeds ([6]). Therefore, the objective of this work is to evaluate the efficacy of the fungicide Premise 25 FS for the control of damping-off diseases in sesame.

2. FIELD EXPERIMENT

Field experiment was conducted under rain fed conditions during season 2013/014 in central and northern area of Gedarif State against seed and soil-borne diseases. Sesame seeds were treated with Premise 25 FS at the rates 3, 4.5, 6, 7 and 7.5 ml /kg seed and an untreated control was included. The treatments were arranged in a Randomize Complete Block Design with four replicates. The crop was grown in subplots (4 m × 4

rows × 60 cm.) of each using sesame variety promo at rate of 400 seed / subplot. Sesame seedling emergences after 1 week, and post-emergence damping off after 2 weeks were recorded and grain yield was determined at harvest. Then the collected data were statistically analyzed.

3. IN VITRO TEST OF FUNGICIDE PREMIS 25 FS ON GROWTH OF ISOLATED FUNGUS

The efficacy of different concentrations of Premise 25 FS in ppm on an in vitro growth of the isolated fungus *Macrophomina* sp. as a representative for seed and soil-borne fungi was tested on potato dextrose agar (PDA). The growth of the fungus was treated by four concentrations of the fungicide Premise 25 FS at the rate of 2000, 1000, 500, 250 and 125 ppm. After solidification of the autoclaved PDA media in sterilized Petri plates, Tow of 5mm mycelial discs were cut from the margin of actively growing colony and each was placed in the polar position of PDA medium in each Petri plate. Then each cocentation of the fungicide was placed in the centre of each petriplate. Triplicates were used for each treatment. The Petri Plates are incubated at 25 ± 20 OC and the inhibition zone of the growth of the fungus was measured in cm after 10 days.

3.1 Residues analysis of Premise 25 FS

Samples were collected at harvest for residue analysis. Extraction and clean-up was carried out by standard method. TLC was used for residue analysis.

3.2 Effect of Premise 25 FS on % Seedling Emergence, Post Emergence Damping off and Yield of Sesame

The results in Tables (1) and (2) showed significant difference in percent seedling emergence, post emergence damping off and yield of sesame between the treated and untreated sesame seeds in both locations. The

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treatments of the fungicide Premise at 3, 4.5 and 6ml /kg of seed gave significantly (at ≥ 0.05) high percent seedling emergence (83.8, 80.3 and 82.3%) respectively in northern Gedarif area (Table 1) In central Gedarif area, the highest percent of seedling emergence was obtained from the seed treated with 3 and 7.5 ml /kg (87.4 and 87.8%) respectively (Table 2). However, Premise at 3 ml /kg seed consistently gave significant high percentages of seedling emergence (83.8 and 87.4%), reduced the incidence of post emergence damping-off (0.5 and 1.3%) and gave significant higher yield (245 kg and 200 kg/ fedan) compared to other treatments and the untreated control in both areas. These results agreed with those of [9]; [10]. They stated that, the treatment of sesame seed with fungicides were found to be effective in reducing damping-off diseases caused by *Fusarium solani*, *Rhizoctonia solani* and *Macrophomina phaseolina* and increasing yield, protein and oil content of seed.

3.3 Effects of Different Concentrations of Premise 25 FS on in Vitro Growth of the Fungus Isolated

The result of the effect of different concentrations of Premise 25 FS on in vitro growth of the fungus isolated was shown in Table (3). The growth of the fungus was inhibited by the four concentrations of Premise 25 FS compared to the untreated control (0 ppm). This result is in agreement with ([8]) and ([12]). The inhibition effect of fungicide Premise 25 FS on the growth of a serious disease and the main destructive pathogen on sesame *Macrophomina phaseolina* ([1]) and ([4]; [5]), proved to be a good controlling value against the complex sesame seed and soil-borne pathogenic fungal diseases.

4. RESULT OF THE RESIDUES ANALYSIS OF PREMIS 25 FS (TRITICONAZOLE)

At harvest, no residues were detected in sesame samples.

5. CONCLUSIONS

- The fungicide premise 25 FS (Triticonazole) at the rate of 3 ml / kg seed of sesame significantly increased seedling emergence, reduced post-emergence damping off disease and increased sesame yield compared to the untreated control.
- In an in vitro test, the fungicide Premise 25 FS (Triticonazole) at different concentrations in (ppm) significantly inhibited the growth of the fungus compared to untreated control.
- The usage of Premise 25 FS (Triticonazole) on sesame is safe if used at the recommended dosage rate.

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Table 1: Effect of Premise 25 FS on % seedling emergence, post emergence damping off and yield of sesame season (2013/014), Northern Gedarif.

Fungicide Rate (ml/kg seed)	Northern Gedarif		
	%seedling emergence	% post - emergence damping-off	Yield kg/fed
Premise 25 FS at 3ml	83.8a	(0.5) 1.0 b	245.9a
Premise 25 FS at 4.5ml	80.3a	(0.8)1.14 b	219.5 a
Premise 25 FS at 6ml	82.3a	(0.3)0.89b	224.6a
Premise 25 FS at 7ml	78.0a	(0.8)1.14 b	195.8ab
Premise 25 FS at 7.5ml	78.0a	(0.0)0.71b	169.2b
Untreated control	71.0b	(9.3)3.13a	148c
SE±	2.30	0.41	8.9
CV%	13.28	19.20	20.05

Percent of damping-off was transformed to the formula $\sqrt{x+0.5}$; Actual percentage data are between parentheses. Means in the same column not followed by the same letter(s) are significantly different at 0.05%.

Table 2: Effect of Premise 25 FS on % seedling emergence, post emergence damping off and yield of sesame season (2013/014), Central Gedarif.

Fungicide Rate (ml/kg seed)	Central Gedarif		
	% seedling-emergence	% post-emergence damping-off	Yield kg/fed
Premise 25 FS at 3ml	87.4a	(1.3) 1.34b	200.8a
Premise 25 FS at 4.5ml	77.6a	(2.0)1.58b	197.0a
Premise 25 FS at 6ml	83.4a	(0.5)1.0b	193.8a
Premise 25 FS at 7ml	86.2a	(1.3)1.34b	191.7a
Premise 25 FS at 7.5ml	87.8a	(1.5)1.41b	177.6b
Untreated control	60.0b	(12.5)3.61a	160.4c
SE±	3.5	0.52	5.48
CV%	16.81	12.40	14.22

The legend; same as described in table 1.

Table 3: Effect of different concentration of Premise 25FS on in vitro growth of *Macrophomina* sp

Concentration (ppm)	inhibition zone of fungal growth (cm)
2000	2.9
1000	2.4
500	2.8
250	2.6
125	1.9
0	0.0