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POPULATION DENSITY OF SOIL MITES UNDER TEN VARIETIES OF MAIZE PLANTS AND RESPONSE OF THE RED SPIDER MITE *Tetranychus urticae* (KOCH) TO MAIZE VARIETIES .

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ABSTRACT

Field trials were carried out in maize fields through 2004 & 2005 seasons at Gemmeiza Agricultural Research Station . The correlation between mite population exiting in soil and on ten maize varieties was counted. Soil mites evaluation was done at three months while phytophagous mites *Teranychus urticae* (Koch) was counted weekly all over the growing seasons of maize .

Data indicated that the mean numbers of any soil mites Actinedida, Oribatida, Gamasida and Acaridida were significantly differed according to different maize varieties.

It was also recorded that all maize varieties were susceptible to mite *T . urticae* (Koch) with different degrees .

INTRODUCTION

Maize occupies an important position among the cereal crops in Egypt . Mites play an important role in soil and growth of crops.They acts as degradators to organic matter that leads in turn to soil fertility. Moreover , some mites acts as predators and parasites on developmental stage of the injuries species of mites and insects (EL – kifle 1957 , 1968 and Tadros , 1975). The red spider mites *Tetranychus* spp . cause great damage to different filed crops in Egypt , most probably due to the side effects of the widespread application of organic pesticides in agriculture . The appearance of mites on maize leaves in comparatively higher levels occurred during the period July to September (Abo-korah (1978), and a positive relationship between mite infestation and both nitrogen and protein maize contents , while this relation was negative with moisture content (Sawires 1990) . The commercial maize variety D.C.215 appeared to be highly susceptible to *Tetranychus* spp. infestation while other varieties (D.C.204 Three way C.310,Comp . 45 and Giza 2) were less susceptible (Lutfallah *et al*. 1990) . Soil fauna always flourish under grown crops and when a crop in harvested or cut a drop in fauna population occurs. Sharshir 1986 and Gameih *et al*. 1993) .

The main target of the present study was to survey and measure the population dynamics of mites occurring in soil under ten commercial maize varieties (310,320,321,322,323,324,352 Watania , Nefertety and Pioneer 3057) in Gemmeiza Governorate and evaluate the response of these varieties to infestation of the red spider mite *T. urticae* . (Koch).

MATERIALS AND METHODS

Two field experiments were carried out at Gemmeiza Agricultural Research Station during 2004– 2005 seasons . The commercial varieties (310,320,321,322,323,324,352 Watania 1 , Nefertety and Pioneer 3057) were tested . The experimental area was divided in to 40 plots , each plot was 6X7 meters. The normal agricultural Practices of growing maize were adopted. Each variety was replicated four times in complete randomized block design , and no chemical insecticides or acaricides were applied .

A sample of 20 leaves of each plot was taken weekly to laboratory to count the moving stages of spider mites *T. urticae* (Koch) on the lower surface of the blade ,statistical analysis was carried out using ANOVA test .

Soil sample were taken periodically every 15 days by a sampling tool vol . 1000 cc at on depth 0-15cm. under each maize variety . Extraction of mites were carried out by using the modified Tullgren funnel for 24 hours . Samples were taken by metal cylinder adapted and described by El –kifle (1957) till 15 cm. depth .

RESULTS AND DISCUSSION

Statistical analysis showed that, there were highly significant differences between maize varieties for their relative susceptibility to *T. urticae* (Koch) infestation . From tables (1&2) it could be concluded that the infestation of the spider mite *T. urticae* (Koch) gradually increased up to the seventh count, then suddenly the population declined in the eight count.

Table (1): Susceptibility of some maize varieties to the red spider mite *Tetranychus urticae* (Koch) **during the season 2004 .**

Maize variety	Total number of mites /20 leaves								Total	Mean
	1/6	11/6	21/6	1/7	10/7	20/7	30/7	9/8		
310	7	11	12	3	4	156	204	8	405	50.63
320	11	52	42	54	22	234	261	10	686	85.75
321	7	12	35	19	8	198	243	11	533	66.63
322	22	67	88	92	26	247	281	27	850	106.25
323	28	62	82	81	24	235	279	23	814	101.75
324	25	58	52	68	22	238	270	18	751	93.88
352	3	13	20	3	7	141	198	8	393	49.13
Watania 1	8	27	44	32	13	223	249	10	606	75.75
Nefertety	12	38	33	43	15	219	258	11	629	78.63
Pioneer 3057	2	10	14	3	4	103	192	7	335	41.88
Total	125	350	422	398	145	1994	2435	133	6002	750.28
Mean	12.5	35.0	42.2	39.8	14.5	199.4	143.5	13.3	600.2	75.028
L.S.D.	1.118	4.005	3.353	3.649	2.176	14.284	11.096	1.221	--	--

The highest number of mite infestation were occurred with 322 and 323 varieties which received (850 – 814), (733 – 685) individuals during the two seasons 2004&2005 respectively. While cultivars 320 ,321,324,352,

Watania and Nefertety were moderately infested . The lowest infested cultivars were 310 and Pioneer 3057 which received (405-335) and (413-297) individuals during the two seasons respectively. The infestation with phytophagous mite , *T. urticae* proved to differed in according to the tested maize varieties

Table (2): Susceptibility of some maize varieties to the red spider mite *Tetranychus urticae* (Koch) during the season 2005 .

Maize variety	Total number of mites /20 leaves								Total	Mean
	1/6	11/6	21/6	1/7	10/7	20/7	30/7	9/8		
310	9	10	11	15	9	141	211	7	413	51.62
320	5	41	35	41	18	219	252	11	622	77.75
321	8	22	31	20	13	176	224	13	507	63.38
322	17	45	65	76	19	226	263	22	733	91.62
323	18	36	61	68	15	213	254	20	685	85.63
324	14	31	42	53	13	210	250	16	629	78.62
352	5	16	19	13	11	122	176	9	371	46.38
Watania 1	9	22	38	21	19	201	227	11	548	68.50
Nefertety	11	27	21	32	13	197	234	10	545	68.12
Pioneer 3057	4	9	11	5	12	81	170	5	297	37.13
Total	100	259	334	344	142	1786	2261	124	5350	668.75
Mean	10.0	25.9	33.4	34.4	14.2	178.6	226.1	12.4	535.0	66.87
L.S.D.	1.124	2.557	2.146	3.588	1.295	23.285	9.374	1.325	--	--

Table (3) indicated that the total numbers and percentages of surveyed soil mite suborders under tested maize varieties per square meter during the time of experiment . Actinedidae was found to be the most dominant group (2952.00) individuals,while Acaridida was the least (1335.83) individuals also, results showed that the total number of any suborder recorded under maize varieties had differed significantly .

Table (3): Population density of soil mites for some varieties of maize plants.

Months	Actinedida	Oribatida	Gamasida	Acaridida	Total	Mean
15/June	137	260	75	50	522	130.50
30/June	155	302	96	70	623	155.75
15/ July	1493	1603	432	241	3769	942.25
30/July	1581	1849	670	592	4692	1173.00
15/Augu.	6779	5864	3821	2910	19374	4843.5
30/Augu.	7567	6534	5217	4152	23470	5867.50
Total	17712	16412	10311	8015	52450	13112.5
Mean	2952.00	2735.333	1718.500	1335.833	8741.66	2185.41
L.S.D. 5%	464.39	155.47	240.74	74.18	--	--
L.S.D.1%	560.72	221.14	342.43	105.51	--	--

The results confirms those obtained by Hussein 1972, Mitchell 1979, Al Assiuty 1981, Rather and Mir 1986, Sharhir 1986,Hafez *et al*. 1989 and Gamieh 1991,1993). Since they recorded the flourishing and dispersion of soil mites during the season then decreased after harvesting or cutting crop and the dispersion of mites depend on location variation of different plantation soil moisture and soil type.

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دراسة الكثافة العددية لأكاروسات التربة والأكاروسات نباتية التغذية على عشرة أصناف من الذرة

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أجريت التجربة بمحطة البحوث الزراعية بالجميزة – غربية خلال عامى 2004-2005 وذلك لدراسة الارتباط بين حلم التربة والأكاروسات نباتية التغذية *Teranychus urticae* وعشرة أصناف من الذرة خلال مراحل النمو .

وتم أخذ العينات الورقية أسبوعيا بأخذ 25 ورقة من كل مكررة عشوائيا أما عينات التربة فكانت تؤخذ بواسطة المكعب الحديدي 10x 10 x 10 سم على عمق (صفر-15سم) وتم فصلها بواسطة أقماع برليزى .

وأوضحت النتائج أن:-

لوحظ أن جميع أصناف الذرة كانت حساسيتها للإصابة بحلم العنكبوت الأحمر العادى على درجات مختلفة وكانت أكثر الأصناف إصابة هى 322، 323 وأقل الأصناف إصابة هى صنف 310، بيونير 3057 أما بالنسبة لأكاروسات التربة تم تسجيل أكاروسات تابعة لأربعة مجاميع تقسيمية هى Actinedida,Oribatida,Gamasida and Acaridida كانت تواجد بوفرة مع جذور نباتية التربة فى طبقة التربة السطحية وكانت أكثر المجاميع Actinedida حيث بلغ متوسط الكثافة العددية 2952 فرد أقلها Acaridida بمتوسط 1335.83 فردا .
وعموما كان هناك اختلافات معنوية بين التحت رتب المختلفة للأصناف العشرة من الذرة .