

## SUPPLEMENTARY MATERIAL

### **Impact of maize irrigation intervals and potassium fertiliser rates on mealybug populations, vegetative growth, and resulting yield**

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**Table S1.** Weekly number of *Phenacoccus solenopsis* individuals per sample as affected by irrigation periods and potassium fertiliser rates in maize plants during the two growing seasons (2021 and 2022)

Sampling date (week)		Number (mean $\pm$ SE) of individuals									
		first growing season (2021)					second growing season (2022)				
		time of irrigation				average	time of irrigation				average
		every 7 days (I <sub>1</sub> )		every 10 days (I <sub>2</sub> )			every 7 days (I <sub>1</sub> )		every 10 days (I <sub>2</sub> )		
		potassium fertiliser rate (kg K <sub>2</sub> O·ha <sup>-1</sup> )					potassium fertiliser rate (kg K <sub>2</sub> O·ha <sup>-1</sup> )				
0	114	0	114	0	114	0	114	0	114		
June	3 <sup>rd</sup>	4.33 $\pm$ 0.67	2.33 $\pm$ 0.33	3.33 $\pm$ 0.88	2.67 $\pm$ 0.67	3.17 $\pm$ 0.37	4.00 $\pm$ 0.58	2.00 $\pm$ 0.58	2.67 $\pm$ 0.88	2.33 $\pm$ 0.33	2.75 $\pm$ 0.35
	4 <sup>th</sup>	20.33 $\pm$ 3.18	10.33 $\pm$ 0.88	14.67 $\pm$ 1.45	10.00 $\pm$ 0.58	13.83 $\pm$ 1.48	18.67 $\pm$ 2.91	9.33 $\pm$ 0.88	13.33 $\pm$ 1.76	9.00 $\pm$ 0.58	12.58 $\pm$ 1.40
July	1 <sup>st</sup>	47.00 $\pm$ 6.35	25.00 $\pm$ 2.89	34.00 $\pm$ 4.93	22.67 $\pm$ 3.48	32.17 $\pm$ 3.49	42.00 $\pm$ 5.77	22.33 $\pm$ 2.60	30.67 $\pm$ 4.33	20.67 $\pm$ 2.91	28.92 $\pm$ 3.09
	2 <sup>nd</sup>	81.33 $\pm$ 8.82	43.00 $\pm$ 5.51	58.67 $\pm$ 5.21	41.67 $\pm$ 3.84	56.17 $\pm$ 5.48	72.67 $\pm$ 8.19	38.67 $\pm$ 5.21	52.33 $\pm$ 4.33	37.33 $\pm$ 3.38	50.25 $\pm$ 4.90
	3 <sup>rd</sup>	176.00 $\pm$ 15.87	72.67 $\pm$ 2.03	102.33 $\pm$ 5.04	89.00 $\pm$ 3.79	110.00 $\pm$ 12.47	157.33 $\pm$ 14.68	65.33 $\pm$ 1.76	92.00 $\pm$ 4.16	80.67 $\pm$ 2.96	98.83 $\pm$ 11.09
	4 <sup>th</sup>	103.33 $\pm$ 4.41	82.33 $\pm$ 4.33	105.00 $\pm$ 2.89	54.67 $\pm$ 1.76	86.33 $\pm$ 6.32	92.67 $\pm$ 4.33	74.00 $\pm$ 3.46	95.00 $\pm$ 2.89	48.67 $\pm$ 1.76	77.58 $\pm$ 5.77
August	1 <sup>st</sup>	162.67 $\pm$ 18.76	90.67 $\pm$ 10.97	123.00 $\pm$ 4.36	84.67 $\pm$ 9.33	115.25 $\pm$ 10.67	145.33 $\pm$ 17.03	81.33 $\pm$ 9.26	110.33 $\pm$ 3.18	76.33 $\pm$ 8.69	103.33 $\pm$ 9.47
	2 <sup>nd</sup>	247.33 $\pm$ 11.57	136.33 $\pm$ 4.33	171.33 $\pm$ 5.36	123.33 $\pm$ 6.01	169.58 $\pm$ 14.87	221.33 $\pm$ 9.40	122.00 $\pm$ 4.00	152.00 $\pm$ 6.51	111.67 $\pm$ 4.41	151.75 $\pm$ 13.20
	3 <sup>rd</sup>	201.67 $\pm$ 6.67	108.33 $\pm$ 7.26	172.33 $\pm$ 4.33	126.67 $\pm$ 2.40	152.25 $\pm$ 11.35	181.67 $\pm$ 6.67	99.00 $\pm$ 6.66	151.00 $\pm$ 5.51	114.33 $\pm$ 2.33	136.50 $\pm$ 10.00
	4 <sup>th</sup>	280.00 $\pm$ 8.66	156.67 $\pm$ 4.41	219.00 $\pm$ 2.08	122.67 $\pm$ 3.93	194.58 $\pm$ 18.30	250.00 $\pm$ 8.66	141.67 $\pm$ 4.41	195.00 $\pm$ 5.00	109.67 $\pm$ 3.93	174.08 $\pm$ 16.29
Sep-tember	1 <sup>st</sup>	290.00 $\pm$ 5.77	165.33 $\pm$ 3.71	227.67 $\pm$ 5.04	154.67 $\pm$ 2.40	209.42 $\pm$ 16.46	261.67 $\pm$ 6.01	148.00 $\pm$ 3.06	200.00 $\pm$ 7.64	139.00 $\pm$ 2.08	187.17 $\pm$ 14.91
	2 <sup>nd</sup>	166.67 $\pm$ 19.64	98.67 $\pm$ 11.57	145.33 $\pm$ 6.36	92.00 $\pm$ 4.00	125.67 $\pm$ 10.75	148.33 $\pm$ 18.78	88.33 $\pm$ 10.14	119.00 $\pm$ 12.29	82.33 $\pm$ 3.84	109.50 $\pm$ 9.57
General average		148.39 $\pm$ 16.08	82.64 $\pm$ 8.96	114.72 $\pm$ 12.34	77.06 $\pm$ 8.21	105.70 $\pm$ 6.31	132.97 $\pm$ 14.40	74.33 $\pm$ 8.06	101.11 $\pm$ 10.88	69.33 $\pm$ 7.39	94.44 $\pm$ 5.63
LSD at 0.05 level		22.32**	15.24**	10.76**	9.92**	4.31**	21.04**	13.38**	15.23**	8.95 **	3.21**
LSD at 0.05 level <sup>1)</sup>		14.72**					14.63**				

<sup>1)</sup> Between times of irrigation, potassium levels and inspected dates; SE = the standard error; LSD = least significant difference.

\*\* Significant at  $P \leq 0.01$ .

Source: own study.

**Table S2.** Averages of *Phenacoccus solenopsis* individuals per sample and measurements of vegetative growth of the maize plants as affected by irrigation periods and K fertiliser rates during the two growing seasons (2021 and 2022)

Treatment		Mean number of individuals per sample $\pm SE$		Means of vegetative growth $\pm SE$					
				plant height (cm)		stem diameter (cm)		No. of green leaves per plant	
		2021 season	2022 season	2021 season	2022 season	2021 season	2022 season	2021 season	2022 season
I	I <sub>1</sub>	115.51 $\pm$ 6.31 (+16.99 %)	103.65 $\pm$ 11.16 (+17.78%)	231.00 $\pm$ 0.58	235.83 $\pm$ 0.44	3.45 $\pm$ 0.03	3.30 $\pm$ 0.01	13.83 $\pm$ 0.17	15.17 $\pm$ 0.17
	I <sub>2</sub>	95.89 $\pm$ 10.20	85.22 $\pm$ 9.06	243.25 $\pm$ 1.88 (+5.30%)	248.50 $\pm$ 2.00 (+5.37%)	3.62 $\pm$ 0.04 (+4.95%)	3.47 $\pm$ 0.02 (+5.24%)	14.42 $\pm$ 0.08 (+4.22%)	15.75 $\pm$ 0.25 (+3.85%)
LSD at 0.05 level		13.29**	11.33**	10.26*	10.12*	0.16*	0.14*	0.36*	0.37*
K	K <sub>1</sub>	131.56 $\pm$ 14.10 (+39.31%)	117.04 $\pm$ 12.56 (+38.63%)	225.17 $\pm$ 1.30	229.75 $\pm$ 1.30	3.37 $\pm$ 0.02	3.22 $\pm$ 0.02	13.08 $\pm$ 0.22	14.42 $\pm$ 0.36
	K <sub>2</sub>	79.85 $\pm$ 8.49	71.83 $\pm$ 7.63	249.08 $\pm$ 1.12 (+10.62%)	254.58 $\pm$ 1.08 (+10.81%)	3.70 $\pm$ 0.03 (+9.77%)	3.56 $\pm$ 0.02 (+10.49%)	15.17 $\pm$ 0.30 (+15.92%)	16.50 $\pm$ 0.25 (+14.45%)
LSD at 0.05 level		6.95**	6.46**	4.23**	3.64**	0.07**	0.07**	1.16**	1.17**
I <sub>1</sub>	K <sub>1</sub>	148.39 $\pm$ 16.04 (+22.69%)	132.97 $\pm$ 14.40 (+23.96%)	222.67 $\pm$ 0.67	226.67 $\pm$ 0.67	3.33 $\pm$ 0.02	3.18 $\pm$ 0.01	12.83 $\pm$ 0.17	14.17 $\pm$ 0.44
	K <sub>2</sub>	82.64 $\pm$ 8.96 (+6.76%)	74.33 $\pm$ 8.06 (+6.73%)	239.33 $\pm$ 1.76	245.00 $\pm$ 1.53	3.57 $\pm$ 0.03	3.42 $\pm$ 0.03	14.83 $\pm$ 0.44	16.17 $\pm$ 0.17
I <sub>2</sub>	K <sub>1</sub>	114.72 $\pm$ 12.34	101.11 $\pm$ 10.88	227.67 $\pm$ 2.03 (+2.25%)	232.83 $\pm$ 2.05 (+2.72%)	3.41 $\pm$ 0.05 (+2.25%)	3.25 $\pm$ 0.02 (+2.16%)	13.33 $\pm$ 0.33 (+3.90%)	14.67 $\pm$ 0.33 (+3.53%)
	K <sub>2</sub>	77.06 $\pm$ 8.21	69.33 $\pm$ 7.39	258.83 $\pm$ 2.17 (+8.15%)	264.17 $\pm$ 2.20 (+7.82%)	3.83 $\pm$ 0.04 (+7.48%)	3.69 $\pm$ 0.04 (+8.12%)	15.50 $\pm$ 0.29 (+4.49%)	16.83 $\pm$ 0.44 (+4.12%)
General average		105.70 $\pm$ 6.31	94.44 $\pm$ 5.63	237.13 $\pm$ 4.26	242.17 $\pm$ 4.38	3.54 $\pm$ 0.06	3.39 $\pm$ 0.06	14.13 $\pm$ 0.35	15.46 $\pm$ 0.36
LSD at 0.05 level		9.83**	9.13**	5.99**	5.15**	0.10*	0.10*	N.S.	N.S.

Explanations: each value is the mean of the four different replicates  $\pm SE$ ; I = irrigation frequency: I<sub>1</sub> = every 7 days, I<sub>2</sub> = every 10 days; K = potassium fertilisation levels (K<sub>2</sub>O): K<sub>1</sub> = 0 kg·ha<sup>-1</sup>, K<sub>2</sub> = 114 kg·ha<sup>-1</sup>.

\* Significant at  $P \leq 0.05$ . \*\* Significant at  $P \leq 0.01$ . N.S. = insignificant.

Source: own study.

**Table S3.** Averages of maize yield and its components as influenced by irrigation periods and K fertiliser rates during the two growing seasons (2021 and 2022)

Treatment		Ear length		Ear weight (g)		No. of grains per ear		1000-grains weight (g)		Grain yield (Mg-ha <sup>-1</sup> )	
		2021 season	2022 season	2021 season	2022 season	2021 season	2022 season	2021 season	2022 season	2021 season	2022 season
I	I <sub>1</sub>	20.54 ±0.08	20.80 ±0.01	254.53 ±0.39	261.67 ±0.87	452.92 ±7.91	495.67 ±5.47	298.67 ±0.73	307.17 ±1.97	5.84 ±0.03	6.15 ±0.02
	I <sub>2</sub>	21.25 ±0.04 (+3.45%)	22.05 ±0.05 (+5.97%)	268.75 ±1.88 (+5.59%)	277.08 ±2.32 (+5.89%)	480.08 ±2.96 (+6.00%)	520.17 ±1.86 (+4.94%)	315.58 ±2.80 (+5.66%)	319.42 ±2.84 (+3.99%)	6.16 ±0.04 (+5.45%)	6.50 ±0.04 (+5.60%)
LSD at 0.05 level		0.49*	0.14**	8.95*	13.63*	22.69*	23.97*	15.04*	3.78**	0.18*	0.16*
K	K <sub>1</sub>	19.83 ±0.09	20.36 ±0.13	248.28 ±1.70	256.50 ±1.88	440.42 ±2.98	483.92 ±6.42	291.17 ±2.17	293.83 ±2.76	5.69 ±0.04	6.01 ±0.07
	K <sub>2</sub>	21.96 ±0.01 (+10.71%)	22.49 ±0.10 (+10.48%)	275.00 ±1.18 (+10.76%)	282.25 ±0.95 (+10.04%)	492.58 ±10.68 (+11.84%)	531.92 ±8.47 (+9.92%)	323.08 ±1.26 (+10.96%)	332.75 ±2.36 (+13.24%)	6.31 ±0.03 (+10.77%)	6.65 ±0.04 (+10.72%)
LSD at 0.05 level		0.36**	0.48**	5.46*	6.03**	22.81**	32.09*	6.96**	3.70**	0.13**	0.18**
I <sub>1</sub>	K <sub>1</sub>	19.55 ±0.10	19.84 ±0.17	245.07 ±1.39	253.33 ±1.17	419.50 ±3.04	464.17 ±8.81	287.33 ±1.45	289.67 ±2.60	5.63 ±0.04	5.94 ±0.07
	K <sub>2</sub>	21.53 ±0.07	21.77 ±0.15	264.00 ±2.08	270.00 ±2.89	486.33 ±4.29	527.17 ±5.38	310.00 ±2.89	324.67 ±1.74	6.05 ±0.04	6.37 ±0.03
I <sub>2</sub>	K <sub>1</sub>	20.12 ±0.09 (+2.90%)	20.88 ±0.10 (+5.21%)	251.50 ±2.02 (+2.63%)	259.67 ±2.60 (+2.50%)	461.33 ±3.76 (+9.97%)	503.67 ±4.06 (+8.51%)	295.00 ±2.89 (+2.67%)	298.00 ±2.93 (+2.88%)	5.76 ±0.05 (+2.32%)	6.07 ±0.07 (+2.32%)
	K <sub>2</sub>	22.38 ±0.07 (+3.95%)	23.22 ±0.07 (+6.67%)	286.00 ±2.18 (+8.33%)	294.50 ±2.29 (+9.07%)	498.83 ±7.07 (+2.57%)	536.67 ±1.76 (+1.80%)	336.17 ±3.24 (+8.44%)	340.83 ±3.00 (+4.98%)	6.56 ±0.04 (+8.35%)	6.93 ±0.05 (+8.66%)
General average		20.90 ±0.34	21.42 ±0.38	261.64 ±4.78	269.38 ±3.27	466.50 ±6.94	507.92 ±6.30	307.13 ±5.74	313.29 ±6.28	6.00 ±0.11	6.33 ±0.12
LSD at 0.05 level		N.S.	N.S.	7.72*	8.53*	N.S.	N.S.	9.84*	5.23*	1.87*	0.26*

Explanations as in Table S2.

\* Significant at  $P \leq 0.05$ ; \*\* Significant at  $P \leq 0.01$ ; N.S. = insignificant.

**Table S4.** Simple correlation, regression coefficients, and explained variance estimates between the mean numbers of *P. solenopsis* individuals and the measurements of the vegetative growth, grain yield, and its components of the maize plants over the two growing seasons (2021 and 2022)

Parameter		First season (2021)						Second season (2022)					
		<i>r</i>	<i>b</i>	<i>SE</i>	<i>T</i> -test value	$Y = a \pm bx$	<i>EV</i> %	<i>r</i>	<i>b</i>	<i>SE</i>	<i>T</i> -test value	$Y = a \pm bx$	<i>EV</i> %
Vegetative growth	plant height	-0.84	-0.40	0.083	4.88**	279.91 – 0.40x	70.39	-0.85	-0.47	0.093	5.11**	286.91 – 0.47x	72.32
	stem diameter	-0.82	-0.01	0.001	4.47**	4.12 – 0.01x	66.51	-0.83	-0.01	0.001	4.68**	3.99 – 0.01x	68.24
	No. of green leaves per plant	-0.87	-0.03	0.006	5.16**	17.82 – 0.03x	75.90	-0.78	-0.04	0.009	3.89**	18.83 – 0.04x	60.18
Yield and its components	ear length	-0.94	-0.04	0.004	9.97**	24.71 – 0.04x	87.66	-0.91	-0.04	0.006	6.87**	25.54 – 0.04x	82.47
	ear weight (g)	-0.85	-0.46	0.090	5.10**	310.21 – 0.46x	72.03	-0.81	-0.50	0.115	4.34**	316.29 – 0.50x	65.29
	No. of grains per ear	-0.91	-1.01	0.150	6.80**	572.82 – 1.01x	82.17	-0.85	-1.01	0.196	5.15**	603.05 – 1.01x	72.60
	1000 grains weight (g)	-0.84	-0.55	0.110	4.99**	365.11 – 0.55x	71.34	-0.92	-0.74	0.097	7.48**	382.93 – 0.74x	85.16
	grain yield (Mg·ha <sup>-1</sup> )	-0.85	-0.01	0.001	5.01**	7.11 – 0.01x	71.41	-0.84	-0.01	0.001	4.90**	7.51 – 0.01x	70.23

Explanations: *r* = simple correlation coefficient; *b* = simple regression coefficient; *EV*% = explained variance; *SE* = standard error; \*\* significant at  $P \leq 0.01$ .

Source: own study.