

**DATABASE FOR INFESTATION OF DATE PALM BY RED
PALM WEEVIL (*RHYNCHOPHORUS FERRUGINEUS*) IN U.A.E.
AND OMAN**

**Osman Khalifa*, A.H. El Assal*, F.A.A I Ezaby*, M.A. Murse*, S
M.Al Nuaimi* & N S. Al Zehli. ****

Department of Agriculture & Livestock, Al Ain, UAE.

ABSTRACT

Database survey carried out during seasons 1997/98 and 1998/99, covered 7707 and 9476 farms, respectively, with a total of about 1.4-million date palms in.

Evaluation of red palm weevil (*Rhynchophorus ferrugineus* Oliver) infestation (0.15%), showed no difference between the new (51.52%) or old (48.48%) infestation. In both cases, the degree of the medium infestation (73.39%) was higher as compared to light (17.03%) and severe (9.58%) infestation.

Susceptibility of known varieties, showed that Khesab, Khineze, Lolo, Gabre and Helale were more susceptible to infestation as compared to Khalas, Fard, Rezez, Buman, Messle, Bagl and Barhe. As difference is not significant, good quality and high yielding varieties are usually grown.

Statistical analysis indicated that date palms in the age group of 6-10 years, were significantly more susceptible to infestation as compared to any other age group. Date palms 16 and more years old, are more resistant to infestation.

Place of infestation on the date palm stem, showed that infestation at the height of 0-100 cm. was significantly more as compared to infestation occurring at any other height. Infestation recorded higher than one meter, was negligible

Re-infestation and mortality after treatment by insecticide injection, were 1.75% and 1.41%, respectively. So insecticide injection significantly controlled the infestation in the farms.

*PROJECT TEAM MEMBERS. **CROP PROTECTION LABORATORY.

INTRODDUCTION

In its efforts to extend its activities regionally, the Department of Agriculture & Livestock, Al Ain, with the Faculty of Agricultural Sciences, United Arab Emirates University, UAE, drew a protocol with Sultan Qabous University and Ministry of Agriculture, Sultanate of Oman, for the control of Red Palm Weevil (*Rhynchophorus ferrugineus* Oliver) in both Countries.

A joint Four-Year Project, which is extendable after the Project evaluation, was formulated in 1996 for implementation, mainly for the control of red palm weevil infestation. Red palm weevil is becoming a serious pest in both Al Ain (UAE) and Berime (OMAN) neighbor counties.

Project team formulated the database survey for the evaluation of infestation in both countries. Database survey was set up to provide information about the susceptibility of different date palm varieties to infestation, place of infestation on the stem, most susceptible age group of the date palm, and the effect of insecticide injection on the control of infestation.

Evaluation of the Database information collected, will enable us to formulate an Integrated Pest Management (IPM) program for the control of red palm weevil infestation.

The survey was carried out during seasons 1997/98 and 1998/99 in 34 extension centers located in 4 Regions, (Al Ain, Northern, Southern & Western), Department of Agriculture & Livestock, Al Ain, UAE. In each Center, there are 100-1000 farms, each with a minimum of 200 and a maximum of over 1000 palm trees, depending on the size of the farm. The total number of farms surveyed were 7707 and 9476 farms in season 1997/98 & 1998/99, respectively. The Survey covered about 1,325,574 date palms trees. Over 60 different known date palm Cultivars are grown in the farms.

MATERIALS AND METHODS

(1): Degree of *New* and *Old* Infestation:

At the beginning of the Database Survey covering 1,325,574 date palms, 2296 date palms were found to be infested by the red pal weevil reaching 0.15% level. The infestation was evaluated on the basis of new or old infestation if it was one or more than one year old, respectively. In both cases, the level of infestation was classified as low, medium or

severe according to the symptom development and the degree of infestation.

(2): Response of Date Palm *Cultivars* to Infestation:

From a survey of 71975 known *Cultivars*, 1670 were found infested at 2.32% percentage infestation. Infested date palms were grouped according to their known *Cultivars*.

(3): Effect of Age Group on Infestation:

From a survey of 29224 date palms, 629 were found infested, reaching 2.15% percentage infestation. Infested date palms were grouped according to the age group of 1-5, 6-10, 11-15, 16-20 and over 20 years of age.

(4): Place of Infestation on Date Palm Stem:

From a survey of 1,325,574 date palms in the farms, 2092 were reported infested (0.16%). Infested date palms were grouped according to the place of infestation at the height of 0-25, 26-50, 51-100, 101-200, cm. 201-300 and over 300 cm on the stem.

(5): *Re-infestation and Mortality* after Insecticide Injection

(Treatment control).

During the survey of 1,325,574 date palms, 2054 were found infested (0.15%). Infested date palms were injected (treated) with a mixture of concentrated insecticides to control infestation.

Insecticides used were Carbosulfan 25% EC (Marshal), Phenthoate 11% + Dimethoate 41% EC (Rogodial), Dimethoate 18%+Endosulfan 40% EC (Rolfan) and Aluminum phosphide 56-57% (Phostoxin tablets).

Adults, pupae and larvae present in the infested stem tissues were removed. Holes were made, by chisel 10 cm, above the infested area. The number of holes made depends on the severity of infestation. The angle and depth of the holes are decided according to the size of the stem and the location of infestation. Concentrated insecticide was injected in to the holes at the dose of 5, 10, 15 or 20 ml per date palm tree depending on the diameter of the stem and the degree of infestation.

The holes were closed by mud to prevent evaporation of the insecticide injected and to trap any emerging adults or larvae from the treated stem. Soil was heaped around the stem up to the height of 10 cm or more, to induce new roots development so as to make the tree stronger to resist falling if the infestation is very severe.

Plastic sheets to trap and kill any emerging adults or larvae from the treated area then covered the treated stem. After 3-4 weeks the plastic sheets were removed and the number of re-infested and dead date palms were calculated.

RESULTS

(1): Degree of New and Old Infestations:

Analysis of the 0.15% infestation recorded, showed that there was no difference between the new and old infestation as percentages were 51.52% and 48.48%, respectively. The level of medium infestation (73.39%) was higher than the low (17.03%) and the severe (9.58%) infestation.

(Table 1 & 1-A Annex).

2): Response of Date Palm Cultivars to Infestation:

Cultivar Khasab, Khineze, Lolo, Gabri and Helali were more susceptible to infestation as compared to Fard, Khalas, Rezez, Buman, Negal, Bagl and Barhi although difference was not significant It is worth mentioning that Fuhoul was also infested.

(Table 2, & Fig.1).

(3): Effect of Age Group on Infestation:

Percentage infestation was 12.78% at the age up to 5 years and increased to a maximum of 64.78% at the age of 6-10 years. Then the infestation decreased gradually with age to 17.12, 3.28, and 1.28% at the age of 11-15, 16-20 and over 20 years, respectively. Statistical analysis showed that date palms in the age group of 6-10 years were significantly more susceptible to infestation as compared to with any other age group (Table 3 & Fig.2).

(4): Place of Infestation on Date Palm Stem:

Infestation at the height of 0-25, 26-50 and 51-100 cm. were 40.9, 36.8 and 20.4%, respectively. Total percentage of infestation at the height of 0-100 cm was 98.01% which was significantly more as compared to infestation at any other height.

Infestation recorded at the upper heights of 1-2, 2-3, or more, were 1.7, 0.2, and 0.0%, respectively

(Table 4 -A & 4-B: Fig.3,: Table 4-C Annex.).

(5): Re-infestation and Mortality after Insecticide Injection:

The numbers of re-infested and dead palm trees after insecticide injection, were 36 and 29, with the percentage of re-infestation and mortality of 1.75% and 1.41%, respectively. Results showed that insecticide infection successfully controlled infestation up to 98.25% level

(Table5 & Fig. 4).

**Table No. (1): Degree of *Old* and *New* Infestation of Date Palms.
Department of Agriculture & Livestock, Al Ain.**

REGIONS	TOTAL No. of DATE PALMS INSPECTED	NUMBER OF INFESTED DATE PALMS							
		OLD INFESTATION			TOTAL	NEW INFESTATION			TOTAL
		Low	Medium	Severe		Low	Medium	Severe	
Western	355,861	41	444	103	588	47	430	72	549
Al Ain	330948	10	60	9	79	8	178	8	194
Northern	330,989	157	96	17	270	96	167	10	273
Southern	307,776	23	153	0	176	9	157	1	167
Total	1,325,574	231	753	129	1113	160	932	91	1183
	PERCENT INFESTATION (%)	20.75	67.50	11.59	-	13.50	78.80	7.80	-

For detailed data refer to Table 1.A (appendix)

**Table No. (2): Susceptibility of Different Date Palm *Cultivars* To Red Palm Weevil Infestation.
Department of Agriculture & Livestock, Al Ain.**

CULTIVARS	REGIONS				TOTAL	% INFESTATION	
	WESTERN	AL AIN	NORTHERN	SOUTHERN			
Fard	T.P*	3741	1606	1990	1647	8984	1.6
	INF*	45	24	42	35	146	
Khalas	T.P	9679	2509	5261	985	18434	1.8
	INF.	149	49	49	67	332	
Khesab	T.P	1235	976	547	165	2914	3.0
	INF.	29	23	30	8	90	
khenaze	T.P	3969	954	1598	889	7410	3.0
	INF.	100	24	64	41	229	
Buman	T.P	1799	733	889	1030	4451	2.7
	INF.	48	22	28	26	124	
Negal	T.P	3588	1006	1754	1171	7519	2.3
	INF.	97	13	52	17	179	
Lolo	T.P	2004	114	915	191	3224	3.2
	INF.	59	2	39	7	107	
Gesh	T.P	815	1336	382	933	3466	2.0
	INF.	21	16	11	22	70	
Gabre	T.P	734	398	791	151	2074	3.3
	INF.	27	12	30	1	70	
Helale	T.P	650	356	457	152	1615	3.4
	INF.	20	8	24	4	56	
Mesle	T.P	236	120	191	4	551	2.8
	INF.	5	4	7	0	16	
Rezez	T.P	1163	114	179	32	1488	1.6
	INF.	21	1	3	0	25	
Barhe	T.P	556	81	371	262	1270	1.4
	INF.	7	3	6	2	18	
Bagl	T.P	3012	1013	1878	2	5905	2.2
	INF.	64	13	56	0	133	
Fuhoul	T.P	1748	181	493	248	2670	2.7
	INF.	47	4	17	7	75	
LSD		NS	NS	NS	NS	NS	NS

Total number of Date Palms (TP)* =71975

Total number of Infested Date Palms (INF)* = 1670.

Percentage of Infestation = 2.3%.

Fig .(1) Susceptibility of Different Date Palm *Cultivars* To Red Palm Weevil Infestation.

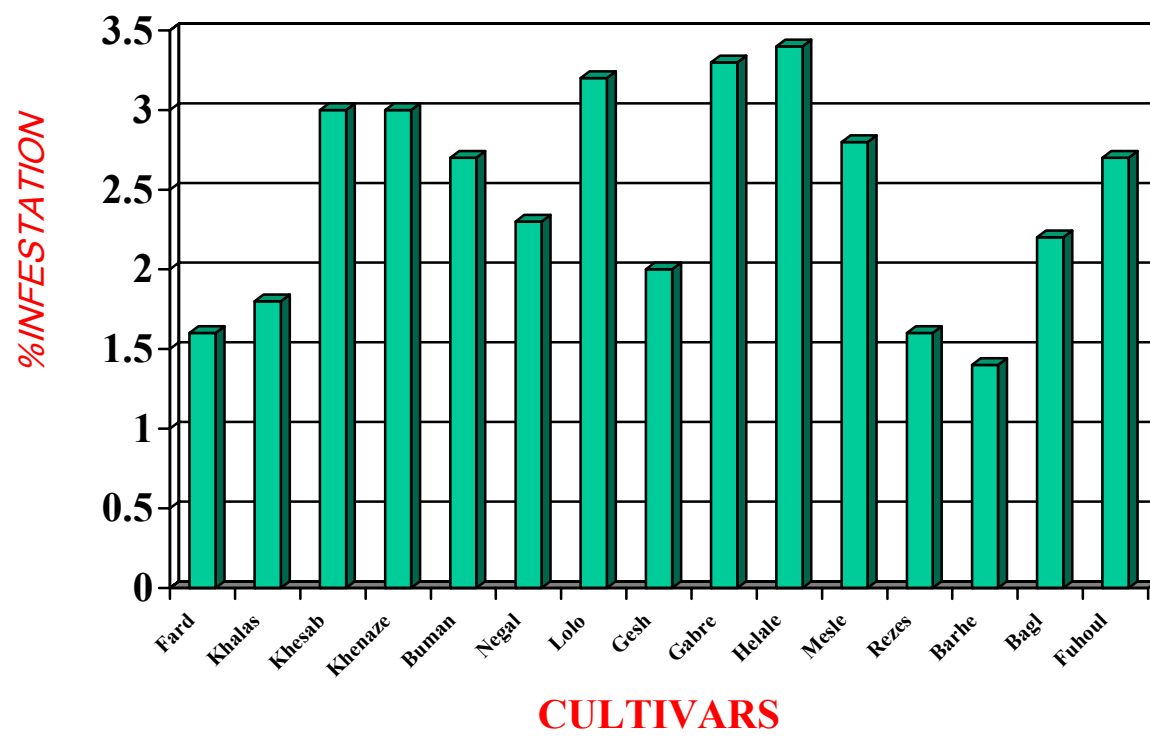
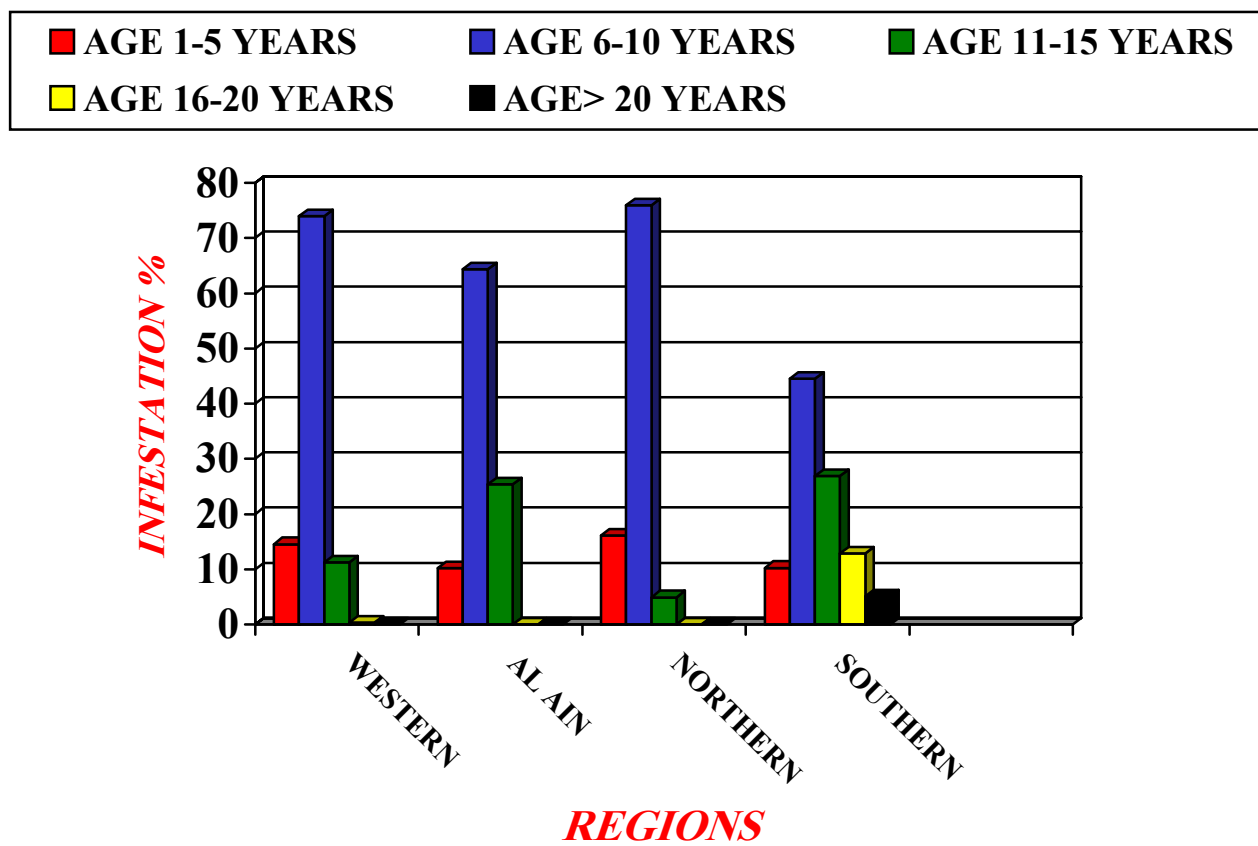


Table No. (3): Evaluation of Infestation According to Date Palm Age Groups.
Department of Agriculture & Livestock, Al Ain.

REGIONS	CENTERS	TOTAL No. of DATE PALMS	INF*	NUMBER OF INFESTED DATE PALMS					TOTAL INFESTED DATE PALMS
				AGE (YEARS)					
				0-5	6-10	11-15	16-20	>20	
WESTERN	Saad South	14881	INF.	48	244	37	1	0	330
			%INF	14.55	73.94	11.21	0.30	0.00	2.2
AL AIN	Qattara	4175	INF.	6	38	15	0	0	59
			%INF	10.17	64.40	25.42	0.00	0.00	1.41
NORTHERN	Hayer	5968	INF.	31	123	8	0	0	162
			%INF	16.14	75.92	4.94	0	0	2.71
SOUTHERN	Wagon	4200	INF.	8	35	21	10	4	78
			%INF	10.26	44.48	26.92	12.82	5.13	1.85
TOTAL No. OF DATE PALMS		29224							629
% INFESTATION (Average Mean)				12.78	64.78	17.12	3.28	1.28	2.15
LSD At 5% Level									14.88

INF*=No. Of infested Date Palms.: % INF=Percent infested Date Palms.

Fig. (2). Evaluation of Infestation According to Date Palm Age



Groups.

Table No. (4) : *Place of Infestation on Date Palm Stem.*
Department of Agriculture &
Livestock, Al Ain.

STEM HEIGHT (cm.)	TOTAL NUMBER OF INFESTED DATE PALMS				TOTAL INFESTED DATE PALMS
	REGIONS				
	WESTERN	AL AIN	NORTHERN	SOUTHERN	
0-25	589	80	78	109	856
26-50	302	125	172	171	770
51-100	127	28	233	38	426
101-200	12	2	21	1	36
201-300	4	0	0	0	4
Over 300	0	0	0	0	0
Total No. of Infested Date Palms	1034	235	504	319	2092
Total No. of Date Palms inspected	355,861	330,948	330,989	307,776	1,325,574

* Detailed data are shown in table 4 – A (appendix)

Table No. (4-B): *Place of Infestation on Date Palm Stem.*
Department of Agriculture & Livestock, Al Ain.

STEM HEIGHT (cm.)	PERCENTAGE OF INFESTATION				TOTAL PERCENT INFESTATION
	REGIONS				
	WESTERN	AL AIN	NORTHERN	SOUTHERN	
0-25	28.2	3.8	3.7	5.2	40.9%
26-50	14.4	6.2	8.2	8.2	36.8%
51-100	6.1	1.3	11.1	1.8	20.4%
101-200	0.6	0.1	1.0	0.0	1.7%
201-300	0.2	0.0	0.0	0.0	0.2%
Over 300	0.0	0.0	0.0	0.0	0.0%
LSD. 5%	4.79	NS	NS	NS	7.65

Fig.(3). *Place of Infestation on Date Palm Stem .*

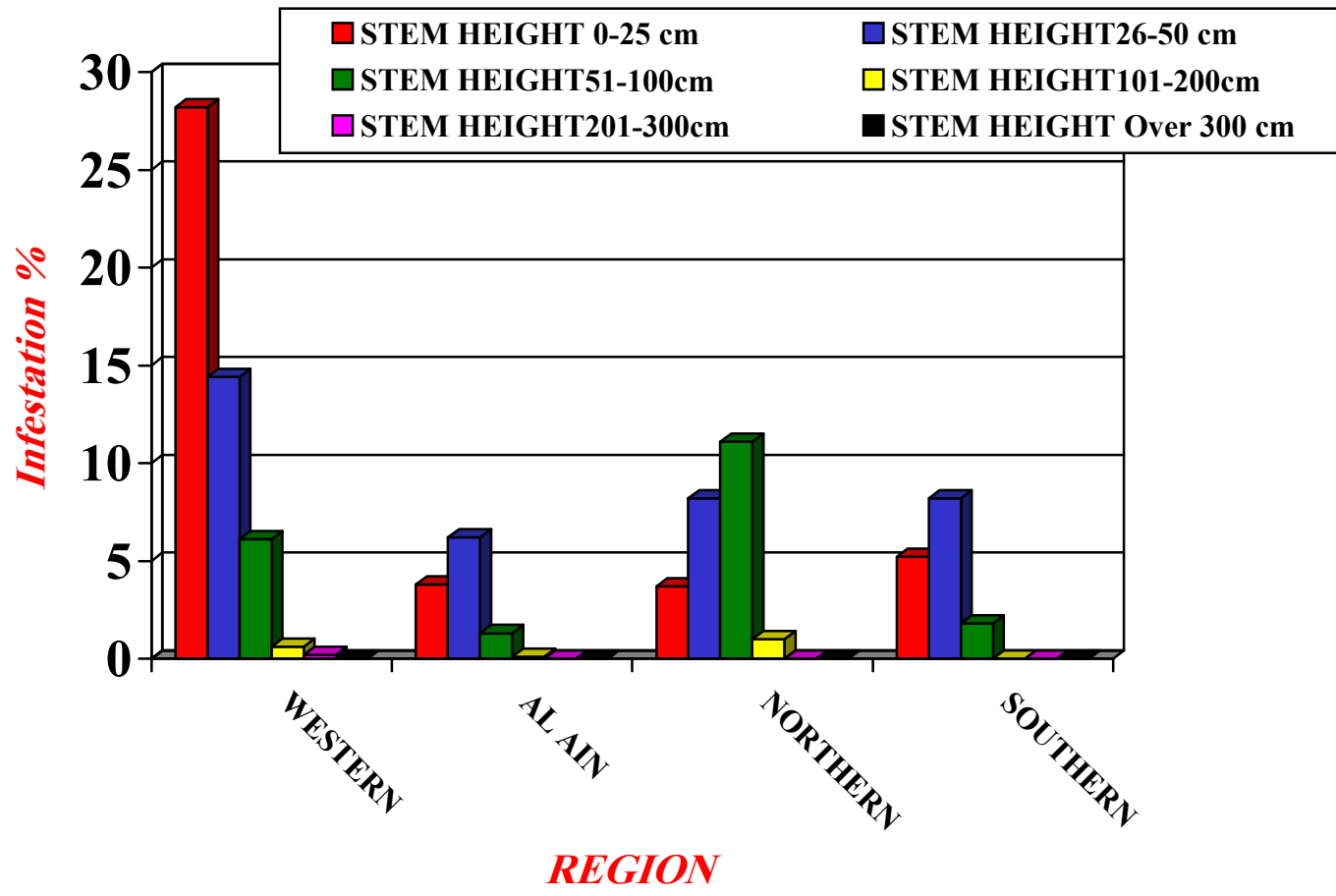
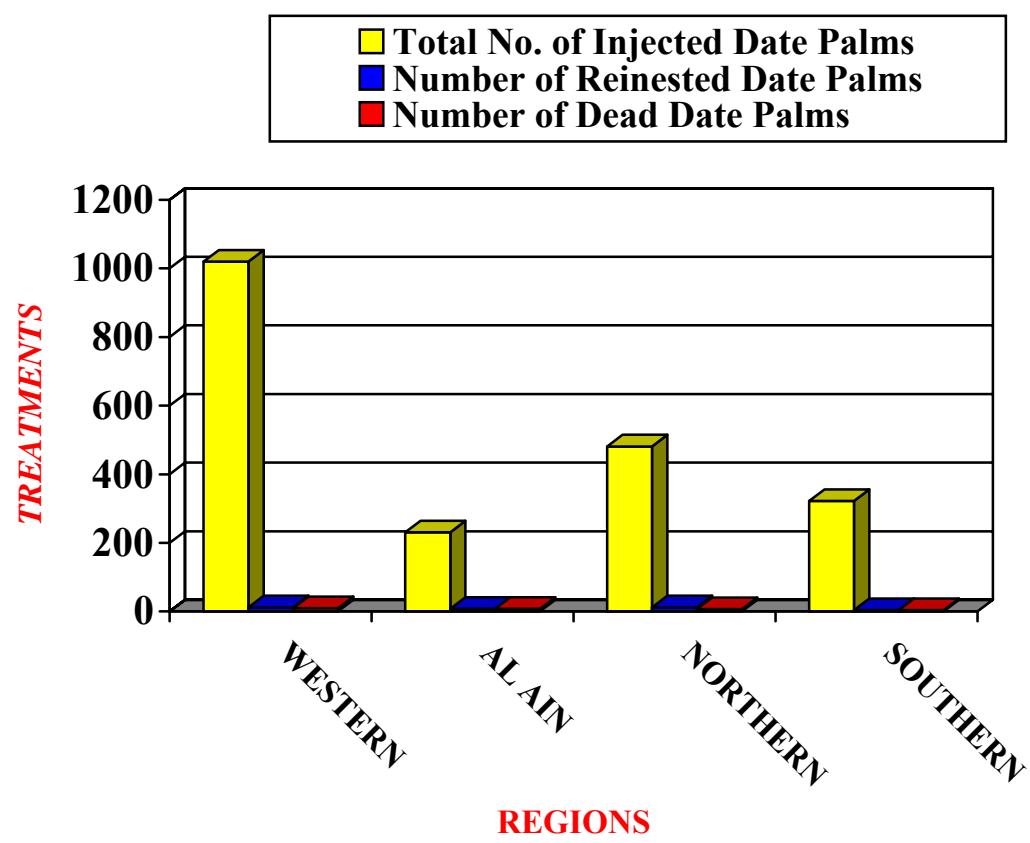


Table No. (5) : *Reinfestation* and Mortality of Date Palms After Insecticide Injection (Treatment). Department of Agriculture, & Livestock, Al Ain.

TREATMENTS	REGIONS				TOTAL
	WESTERN	AL AIN	NORTHERN	SOUTHERN	
TOTAL NO OF DATE PALMS	355,861	330,948	330,989	307,776	1,325,574
TOTAL NO. OF INJECTED DATE PALMS	1020	231	481	322	2054
TOTAL NO. OF REINFESTED DATE PALMS	12	8	12	4	36
TOTAL NO. OF DEAD DATE PALMS	10	8	7	4	29
PERCENTAGE REINFESTATION	1.18	3.46	2.49	1.24	1.75%
PERCENTAGE MORTALITY	0.98	3.46	1.45	1.24	1.41%
PERCENTAGE INFESTATION CONTROL					98.25%

Fig.(4). *Reinfestation and Mortality of Date Palms After Insecticide Injection (Treatment).*



DISCUSSION

Degree of New and Old Infestation:

At the beginning of the database survey red weevil infestation was only 0.15% as an average in all the farms in the Department of Agriculture & Livestock, Al Ain. Data analysis showed that there was no significant difference between the new and the old infestations. The old infestation, more than one year old, was reported mainly in the Western and Southern regions in old farms where date palms are crowded without proper spacing. Low temperatures and high humidity prevailing in the crowded plantations are favorable conditions for adults mating, eggs laying and hatching of larvae, which cause the infestation.

On the other hand, the level of medium infestation was significantly more than the low and severe infestations. This was clearly observed in the Southern region for the same reasons mentioned above. This makes it difficult to discover the infestation early for its control.

Response of Date Palm Cultivars to Infestation:

Evaluation of susceptibility of different Cultivars to infestation, showed that there was no significant difference between the Cultivars grown. However, Cultivars Fard, Khalas, Reziz, Buman, Bagl and Barhi showed some tolerance to infestation as compared to Khalas, Khineze, Lolo, Gabri and Helali. So the farmers tended to grow good quality and high yielding Cultivars.

The establishment of the “Emirate Date Processing Factory” in Al Ain area, with the capacity of 20,000 tons annually, encouraged the farmers to grow the Cultivars that fetch high prices.

Effect of Age Group on Infestation:

Age of the date palms is an important factor affecting their susceptibility to red palm weevil infestation. Statistical analysis

showed that infestation on 6-10 year old date palms (64.78%) was significantly more than infestation recorded in any other age groups. As date palms become older, they tend to become less susceptible to infestation, which was 3.28% and 1.28 % at the age of 16-20 years or more, respectively. On the other hand, date palms up to the age of 5 years, showed less infestation, which may be because most of them have

no proper stem as a base for the infestation. On the other hand, date palms 6-10 years old have well developed soft stems, which are easy to penetrate by the weevils. Old date palms 16 years and more, have very hard stems, which are not attractive for the adult weevils and are not very easy to penetrate causing infestation.

So, farmers should be advised to pay more attention and remove old dry branches of young palms at age of 6-10 years and look carefully for early infestation for immediate control.

Place of Infestation on Date Palm Stem:

Database Survey showed that place of infestation on the stem of the date palm, proved to be an important factor in relation to its susceptibility to infestation. Data analysis revealed that total infestation percentage at the height of 0-100 cm. was 98.01% which was significantly more than infestation occurring at any other height. Infestation at 2, 3, or more meters, was very low, i.e. 1.7%, 0.2%, and 0.0%, respectively.

Maximum infestation at the height of up to one meter may be due to the fact that at this height, low temperatures and high humidity are most conducive for infestation. These conditions are favorable for insect mating, eggs laying and larval hatching, Larvae are known to be the most dangerous stage in the life cycle of the weevil as they are mainly responsible for causing the infestation. Hard and sharp mouthparts of the larvae make it easy for them to penetrate deep into the heart of the stem through any holes causing a lot of damage to the internal tissues of the stem.

Moreover, the weevils are known to fly very low, mostly not more than one meter high, thus causing damage up this height on the date palm stem.

Re-infestation and Mortality after Insecticide Injection:

Different insecticide injections were evaluated in the laboratory for the control of larvae bred in date palm trunk. Those insecticides that gave good control were evaluated in the field by injecting naturally infested date palms in different farms. Insecticide injection of Carbosulfan 25% EC (Marshal), Phenthoate 41% + Dimethoate 11% EC (Rogodial), Dimethoate 40%+ Endosulfan 18% EC (Rolfan) and Phostoxine Tablets, has significantly reduced the infestation in the field up to 98.25%. Percentage re-infestation and mortality were only 1.75 and 1.41%, respectively.

Crop Protection Extension officers do insecticide injection in the farms and also demonstrate to the farmers how to do injection without damaging the palm trees.

No insecticide injection is carried out when date fruits are approaching maturity. But if we want to save any palm tree from dying, we remove all the date fruits before injection of insecticides.

It is worth mentioning that laboratory analysis of fruits collected at different intervals after injection, from infested date palms injected with the same insecticides, gave no insecticide residues.

CONCLUSION

- ◀ Different Cultivars grown showed variable degrees of susceptibility to infestation, though not significant. So farmers may grow good quality and high yielding Cultivars.
- ◀ Significantly severe infestation (98.01%) was recorded at the height of 0-100 cm. up the stem. So farmers are advised to clear all dead branches at this height and look carefully for the infestation for early treatment.
- ◀ Date palms at the age of 6-10 years were severely infested at 64.78% infestation level, which was significantly more than infestation occurring at any other age. It is recommended that farmers should pay more attention to palm trees at this age, especially removal of old dry branches, and to look carefully for any infestation for early treatment.
- ◀ Insecticide injection significantly controlled infestation in all the farms by up to 98.25% level. So it is adopted in the Agriculture Department & Livestock as a major part in the Integrated Pest Management (IPM) program.

IPM PROGRAM

- ◀ Sex Aggregation Pheromones Traps, are put in all the farms for the catch of adult weevils before they mate and lay eggs. A total of 149,893 adult weevils were trapped from July 1999 to June 2000 using 225,728 pheromone sachets in 18,644 traps in 7,012 farms with a total of 1,597,266 date palms. Evaluation of infestation during this period, showed that pheromone traps used, gave a significant reduction in infestation during the season. So pheromone

traps are extensively used in the farms in our efforts to reduce the use of insecticide for the control of Red Palm Weevils.

- ◀ During the period November up to April low temperatures and high humidity are favorable conditions for adults mating and eggs laying. So during the period two insecticide spraying are applied in all the farms for the control of adults before mating and laying eggs. The interval between the first and second spray is about 3 months.
- ◀ In case of any infestation occurring after the use of pheromone traps and insecticide spraying, then insecticide injection is practiced for the immediate control of infestation.

Adoption of this IPM program annually in all the farms in the Department Agriculture & Livestock, resulted in the reduction of infestation to about 0.40% only.

Table No. (1-A): Degrees of *Old* and *New* Infestation after Treatment (Insecticide Injection).

Department of Agriculture & Livestock, Al Ain.

CENTERS	<i>Old infestation</i>				New infestation			
	L*	M*	S*	TOTAL	L*	M*	S*	TOTAL
Khazna w	14	10	10	34	8	42	19	69
Abu Samra	7	46	20	73	10	37	12	59
Ramah	12	0	12	1	1	1	0	2
Saad W	1	28	4	33	14	37	3	54
Saad E	0	18	3	21	10	85	0	95
Saad S	0	194	0	194	0	116	0	116
Sewaihan	7	148	66	221	4	112	38	154
Total	41	444	103	588	47	430	72	549
S.B.Amar	3	2	0	5	4	34	1	39
Al-Yahar	0	0	0	0	0	3	0	3
Salamat W	0	5	1	6	4	62	0	66
Salamat E								
Al-Ain	6	11	0	17	0	0	0	0
Al Qattara	0	31	2	33	0	22	2	24
Um Gafa	1	11	6	17	0	57	5	62
Total	10	60	9	79	8	178	8	194
Masakin	0	0	0	0	0	19	0	19
Gomoth	6	86	6	98	9	121	5	135
El-Hayer	112	4	6	122	51	0	1	52
Moheir	24	0	0	24	19	18	0	37
El-Fagah	3	6	3	12	8	7	1	16
Al-Shewaib	12	0	2	14	9	2	3	14
Nahel	0	3	0	3	0	5	1	6
Total	157	96	17	270	96	167	10	273
Alzahra S	0	0	0	0	0	7	0	7
Alzahra N	0	0	0	0	0	3	0	3
AlArad	0	66	0	0	66	0	0	73
Wagon W	11	36	0	47	9	34	0	43
Wagon E	12	19	0	31	0	35	0	35
AlOya	0	29	0	29	0	0	0	0
Total	23	153	0	176	9	157	0	167
Grand Total	231	753	129	1113	160	932	91	1183

L.* = Light infestation.- M.*=Medium infestation.- S.* = Severe infestation

**Table No. (4-A) : Place of Infestation on Date Palm Stem.
Department of Agriculture, & Livestock, Al Ain.**

CENTERS	NUMBER OF INFESTED DATE PALMS						TOTAL INFESTED DATE PALMS
	STEM HEIGHT (cm.)						
	0-25	26-50	51-100	101-200	201-300	Over 300	
Khazna w	3	40	1	0	0	0	44
Abu Samra	64	11	59	5	1	0	140
Ramah	0	8	6	0	0	0	14
Saad W	47	26	2	0	0	0	75
Saad E	7	110	1	0	0	0	118
Saad S	253	44	19	0	0	0	316
Sewaihan	215	63	39	7	3	0	327
Total	589	302	127	12	4	0	1034
% Infestation	57.0	29.2	12.3	1.2	0.4	0.0	100%
S.B.Amar	9	6	0	0	0	0	15
Al-Yahar	0	1	2	0	0	0	3
Salamat E	1	58	5	0	0	0	64
Al-Ain	0	3	9	2	0	0	14
Al Qattara	2	52	0	0	0	0	54
Um Gafa	68	5	12	0	0	0	85
Total	80	125	28	2	0	0	235
% Infestation	34	53.2	11.9	0.9	0.0	0.0	100%
Masakin	18	0	1	0	0	0	19
Gomoth	1	49	175	0	0	0	225
El-Hayer	46	41	45	21	0	0	153
Moheir	1	61	0	0	0	0	62
El-Fagah	0	16	12	0	0	0	28
Al-Shewaib	12	2	0	0	0	0	14
Nahel	0	3	0	0	0	0	3
Total	78	172	233	21	0	0	504
% Infestation	15.5	34.1	46.2	4.2	0.0	0.0	100%
Alzahra S	1	3	3	0	0	0	7
Alzahra N	3	0	0	0	0	0	3
AlArad	18	106	11	0	0	0	135
Wagon W	15	47	13	1	0	0	76
Wagon E	49	9	11	0	0	0	69
AlOya	23	6	0	0	0	0	29
Total	109	171	38	1	0	0	319
% Infestation	34.2	53.6	11.9	0.3	0.0	0.0	100%

المشروع المشترك لمكافحة سوسة النخيل الحمراء
جامعة الإمارات العربية المتحدة – دائرة الزراعة والثروة الحيوانية – العين
جامعة السلطان قابوس – وزارة الزراعة والثروة السمكية – سلطنة عمان

Name of farm owner -----: اسم صاحب المزرعة	Season -----: الموسم	MONTH: ----- الشهر
Farm Area (No. of palms) -----: مساحة المزرعة (عدد النخيل)	Location (address) ----- عنوان المزرعة	

{ قاعدة البيانات الأساسية لتوضيح إصابة الأصناف المختلفة بسوسة النخيل }
Database for Infestation of Various Date palm Cultivars by Red Palm Weevil.

الرقم No.	عدد النخيل Total No. of Palms	الصنف Cultivar	(1) عدد وأعمار النخيل المصابة (سنة) No. Age of Infested Palms (years)					عدد النخيل المصاب No. of Infested Palms	(1) عدد وأعمار النخيل المصابة (سنة) No. Age of Infested Palms (years)				
			A	B	C	D	E		A	B	C	D	E
			1-5	6-10	11-15	16-20	> 20		1-5	6-10	11-15	16-20	> 20
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													

عدد النخيل المصاب حسب مستوى الإصابة No. of Infested Palms based on Severity Of Infestation						عدد النخيل المكرب No. of Takreeb Palms		عدد النخيل المطاح No. of Dead Palms			(4) المبيد المستخدم للحقن Insecticide Injected					عدد النخيل المصاب بعد الحقن No. of Palms Reinfested After Injection	ملاحظات Remarks مكان الإصابة Place of Infestation
إصابة قديمة (2) Old Infestation			إصابة حديثة (2) New Infestation			معامل Treated	غير معامل Untreated	معامل Treated	غير معامل Untreated	المجموع Total	M	R	RF	PH	O		
(3) منخفضة Low	(3) متوسطة Medium	(3) عالية High	(3) منخفضة Low	(3) متوسطة Medium	(3) عالية High												

التاريخ :

التوقيع :

أسم جامع البيانات (المرشد) :

(1) : أعمار أشجار النخيل (سنوات)

5 - 1 = (A) سنة

10 - 6 = (B) سنة

15 - 11 = (C) سنة...

20 - 16 = (D)

20 = (E)

: (3) : _____

=

=

5-1

=

Q = PH = RF = R = M - : (4)

=

(1) Age group (years.) : A = 1-5 , B = 6-10 , C = 11-15 , D = 16-20 , E = > 20

Years

(2) Infestation : *Old* = More than one year , *New* = Less than one year old

(3) Severity of Infestation: -**Low* = Dryness of the outer leaves, slight or no odor.

**Medium* = Oozing of brown fluid from the holes in the stem, medium to large larvae

are present after removing leafbase cover, damage stem tissues, no cocoon – if present, they will be only 1-5 cocoons .

*High Presence of chewed fibers mainly in stem, with bad smell, many cocoons are noticeable, yellowing of the third leaf – row, sometimes yellowing of internal leaves and the flag leaf, trunk lodging, and death of palm.

(4) Insecticide used: - M = Marshal, R = Rogodial , RF = Rolfan, PH = Phostoxin, O = Other Insecticides