

SURVEY OF RED PALM WEEVIL, (*RHYNCHOPHORUS FERRUGINEUS* OLIVER) INFESTATION IN DATE PALM IN OMAN

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ABSTRACT

Extensive survey studies of Red palm weevil (*Rhynchophorus ferrugineus*) were conducted during 1998-2000 in five villages at Wilayat Buraimi, in Sultanate of Oman. During 1998-99 period a 17031 palms were surveyed of these trees 652 palms (3.83%) infested by Red palm weevil. However, the survey was repeated during 2000 recording 1.73% infested trees. The pest incidence was also recorded in different varieties grown.

The infestation of Red palm weevil was higher in tree groups of 6 - 10 years recording 9.35% followed by 9.22% in 11-15 years old trees however, older trees 16-20 years had very low infestation level of 0.11%.

Infestation at different trunk heights of palms showed maximum infestation of 35.95% at height of 0.6 to 1 m, followed by 22.22% at 1.1 to 1.5 m. however, infestation was detected in trunk height above 3.5 m.

INTRODUCTION

Date palm (*Phoenix dactylifera*) are the most important fruit tree of arid, tropical and sub-tropical regions of the world including Oman and many other Arab countries. In Oman palm trees occupier 82.6% of the fruit area (Date Quality Improvement in Oman, Extension Document No. 1, 1998). The date palm is attacked by a number of insects, but in the recent past the red palm weevil, *Rhynchophorus ferrugineus* Oliver, (Curculionidae: Coleoptera) is causing a menace in Northern Oman particularly in Buraimi, Mahdah and Musandam areas. It is also reported attacking date palm in UAE, Saudi Arabia, Iraq and a number of other countries.

The adult Red palm weevil (RPW) is reddish-brown, measuring about 35 mm in length and bears a prominent snout. Female date palm weevil lays eggs into the wounds created by harvesting and pruning and off-shoots removal, mostly in young palms of age 6-15 years. Hatching grubs tunnel through the soft wood into the heart of the trunk where they complete their life cycle. The damage is due entirely to the larvae, which feed on the trunk and also the growing point viz., the heart or the cabbage of the crown of the palm and once they have gained access, death of the palm generally ensues. Many generations can be passed in the same palm. The symptoms of infestation show the presence of small holes at the leaf scars and oozing out of a reddish-brown fluid and extrusion of fibers from these holes and slightly audible sound of the feeding activity of the grubs within the stem attacked trees. Unfortunately, the attack is discernible unless extensive damage is happened. Later, plant succumbs to death.

Scarce information are available on the biology, ecology, extent of damage, varietal susceptibility and its management of RPW on date palms. Keeping in view the seriousness of RPW, the object of this work is to carry out a thorough survey of date growing areas was in Wilayat Buraimi to gather certain information about the pest incidence.

MATERIAL AND METHODS

Data recording proforma were developed jointly by scientists of Sultan Qaboos University, UAE University, Al-Ain, Ministry of Agriculture and Livestock, Al-Ain and Ministry of Agriculture and Fisheries, Sultanate of Oman to record research information.

The proforma Included information about the farm, its location, total number of palms, old infestation, new infestation, level of infestation as low, medium and high, and date of recording months. The varieties and infestation due to varieties were also recorded. The surveys were carried out during the period 1998-99 and 2000.

Proforma II was developed to record the infestation by red palm weevil in palms of different age group. Palms were categorized into 5 age groups as 1-5, 6-10, 11-15, 16-20 and >20 years. Total number of palms and number of infested palms were recorded under each age group.

Data were In Perform III collected on red palm weevil infestation in relation to trunk height of date palm. The height levels were categorized into 8 levels as 0 - 0.5, 0.6 - 1.0, 1.1 - 1.5, 1.6 - 2.0, 2.1 - 2.5,

2.6 - 3.0, 3.1 - 3.5 and > 3.5 m height from ground level. The number of palms infested under each height group were recorded.

RESULTS

Infestation level of Red palm weevil in different villages:

Surveys of Red palm weevil (*Rhynchophorus ferrugineus*) infestation in date palms were conducted during 1998-99 and 2000 in five villages namely, Al-Ghuraifa, Al-Uqdah, Saara, Buraimi and Hammasah in Wilayat Buraimi, Dhahirah region, Sultanate of Oman, to gather certain basic information on the infestation of the pest on palm trees. A total number of 78 farms were surveyed, 8 in Al-Ghuraifa, 15 in Al-Uqdah, 27 in Saara, 15 in Buraimi and 13 in Hammasah, during 1998-99. The surveys work was repeated during 2000 ceas on and 84 farms were surveyed, 7 in Al-Ghuraifa, 22 in Al-Uqdah, 27 in Al-Saara, 15 in Al-Buraimi and 13 in Al-Hammasah. During 1998-99 (Table 1) a total 17031 date palms were observed, 3097 palms in Al-Ghuraifa, 3938 in Al-Uqdah, 5390 in Saara, 2117 in Buraimi and 2489 in Hammasah. Out of the 17031 palms, 652 palms (3.83%) were found infested by RPW. The infestation was the highest (5.99%) in Hammasah area while it was the least (1.09%) in Al-Uqdah. In the other three areas surveyed the infestation ranged from 4.25 to 4.36%.

Out of 652 infested palms recorded during the survey, 503 palms were with old infestation and 149 with new infestation. Among the old infested palms (Table 2) 241 palms had medium level of infestation and 262 palms with high level of infestation and among the palms with new infestation two palms had low level of infestation, 75 medium and 72 with high level of infestation. This indicates that the infestation in the early stage undergoes unnoticed and the symptom appears later when the infestation increases. We recommend a regular inspection to check the early infection and being control program.

During the repeated survey in 2000 (Table 3), a total of 18980 date palms were observed; 2762 palms in Al-Ghuraifa, 5718 in Al-Uqdah, 5764 in Al-Saara, 2222 in Al-Buraimi and 2514 in Al-Hammasah. Out of 18980 palms only 329 palms (1.73%) were found infested by Red palm weevil. There was a reduction in incidence level from 3.83% to 1.73% from 1998-99 survey to 2000 survey, as an awareness was noticed in the farmers in maintaining the gardens and taking precautionary measures.

Infestation of red palm weevil in different varieties:

During 1998-99, the total number of date palms were 17031 of trees in 78 farms, were surveyed out of these 652 palms (3.83%) were found infested by RPW. The inspected trees belong to 77 varieties. Among these the two varieties (Table 4) i.e. Nagal (3582 palms in 70 farms) and Fardh (3185 palms in 69 farms). Were the dominant Varieties which are grown in good number and in many of the farms are Bagal (901 palms), Khinezi (944 palms), Khasab (821 palms), Jibri (514 palms) and Khalas (565 palms). Certain varieties which were grown in relatively low number but still seen in many farms such as, Boman (398 palms), Hilali (262 palms), Fahal (231 palms), and Lulo (192 palms). Rest of the varieties are grown in lower number.

The varieties grown in large number could be arranged in the following descending order of infestation (Table 4) as Khasab (8.16%), Fahal (6.06%), Bagal (5.99%), Khinezi (5.3%), and Jibri (4.86%). In varieties Boman, Hilali, Fardh and Khalas the infestation was moderate (3.02 to 3.36%), while it was low (2.08 to 2.62%) in Lulo, and Nagal.

The infestation level in the varieties was also recorded during 2000. A total of 84 farms were surveyed with 18980 palms out of which 329 palms were found infested. The infestation level was reduced to 1.73% as compared to 3.83% of 1998-99. In certain varieties like Bagal, Boman, Fahal, Fardh, Jibri, Khalas, Khasab, Khinezi and Nagal, the level of infestation was reduced to 0.89, 2.19, 1.03, 2.13, 1.65, 2.37, 1.71, 1.94 and 2.62% respectively, compared to infestation in 1998-99.

Infestation of red palm weevil in different age groups of palm:

The infestation of RPW (Table 5) was high being 9.35% in palms belonging to the age group of 6-10 years followed by 9.22% in palms belonging to the age group of 11-15 years (9.22%). It was 6.61% in the age group of 1-5 years. The infestation was very low (0.11%) in palms belonging to the age group of 16-20 years and was least (0.02%) in palms belonging to the age group of above 20 years (Table 6). This indicates that young date palms of age between 6-15 years are prone to attack by RPW and needs protection.

Infestation of red palm weevil at different trunk heights of palms:

Studies were made on the relationship of RPW infestation with the trunk height of the palm. It is evident from Table 6 that maximum infestation of 35.95% of RPW was found in palm with trunk height of 0.6 to 1.0 m, followed by 22.22% in trunk height of 1.1 to 1.5 m, 15.69% in trunk height of 1.6 to 2.0 m, while it was 12.42% in palms with trunk height of 0.0 to 0.5 m. The infestation decreased with the increase in trunk height and became nil in palm with trunk height above 3.5 m.

REFERENCE

SQU. 1998. Date quality improvement in Sultanate of Oman - A comprehensive document. Sultan Qaboos University, College of Agriculture. October, 1998, 5-12 pp.

Table 1: Red palm weevil infestation in certain areas in Wilayat Buraimi during 1998 - 99.

| No. | Name of the Area | Total No. of farms surveyed | Total No. of palms | No. of palms infested | | Total No. of palms infested | Infestation % |
|-----|------------------|-----------------------------|--------------------|-----------------------|-----|-----------------------------|---------------|
| | | | | Old | New | | |
| 1 | Al-Ghuraifa | 8 | 3097 | 133 | 2 | 135 | 4.36 |
| 2 | Al-Uqdah | 15 | 3938 | 27 | 16 | 43 | 1.09 |
| 3 | Saara | 27 | 5390 | 187 | 48 | 235 | 4.36 |
| 4 | Buraimi | 15 | 2117 | 50 | 40 | 90 | 4.25 |
| 5 | Hammasah | 13 | 2489 | 106 | 43 | 149 | 5.99 |
| | TOTAL | 78 | 17031 | 503 | 149 | 652 | 3.83 |

Table 2: Infestation levels of Red palm weevil on date palm in certain areas of Wilayat in Buraimi

| Area | No. of infested palms based on the severity of infestation | | | | | |
|------------|--|-----|-----|-----------------|----|----|
| | Old Infestation | | | New Infestation | | |
| | L | M | H | L | M | H |
| Al-Guraifa | 0 | 133 | 0 | 0 | 2 | 0 |
| Al-Uqdah | 0 | 23 | 4 | 0 | 9 | 7 |
| Saara | 0 | 31 | 156 | 0 | 26 | 22 |
| Buraimi | 0 | 2 | 48 | 0 | 18 | 22 |
| Hammasah | 0 | 52 | 54 | 2 | 20 | 21 |
| TOTAL | 0 | 241 | 262 | 2 | 75 | 72 |

L = Low; M = Medium, H = High

Table 3: Trend of RPW Infestation in 5 villages in Wilayat in Buraimi during 2000

| Sr. No. | Name of Area | No. of farms surveyed | Total No. of palms | No. of infested palms | Infestation % |
|---------|--------------|-----------------------|--------------------|-----------------------|---------------|
| 1 | Al-Guraifa | 7 | 2762 | 42 | 1.52 |
| 2 | Al-Uqdah | 22 | 5718 | 97 | 1.70 |
| 3 | Al-Saara | 27 | 5764 | 74 | 1.28 |
| 4 | Buraimi | 15 | 2222 | 44 | 1.98 |
| 5 | Hammasah | 13 | 2514 | 72 | 2.86 |
| | TOTAL | 84 | 18980 | 329 | 1.73 |

Table 4: Red palm weevil infestation in certain date varieties observed during survey in 1998-99 and 2000

| Variety | 1998-99 | | 2000 | |
|---------|-------------|---------------|-------------|---------------|
| | Total Palms | Infestation % | Total palms | Infestation % |
| Bagal | 901 | 5.99 | 224 | 0.89 |
| Boman | 398 | 3.02 | 228 | 2.19 |
| Fahal | 231 | 6.06 | 97 | 1.03 |
| Fardh | 3185 | 3.20 | 847 | 2.13 |
| Hilali | 262 | 3.05 | 157 | 5.10 |
| Jibri | 514 | 4.86 | 363 | 1.65 |
| Khalas | 565 | 3.36 | 422 | 2.37 |
| Khasab | 821 | 8.16 | 350 | 1.71 |
| Khinezi | 944 | 5.30 | 515 | 1.94 |
| Lulo | 192 | 2.08 | 110 | 2.73 |
| Nagal | 3582 | 2.62 | 610 | 1.48 |

Table 5: Red palm weevil infestation in relation to the age of date palm

| Sr. No. | Age Group (Yrs) | Total No. of Palms | No. of Infested Palms | Infestation % |
|---------|-----------------|--------------------|-----------------------|---------------|
| 1 | 1-5 | 1105 | 73 | 6.61 |
| 2 | 6-10 | 2290 | 214 | 9.35 |
| 3 | 11-15 | 1052 | 97 | 9.22 |
| 4 | 16-20 | 1837 | 2 | 0.11 |
| 5 | >20 | 5006 | 1 | 0.02 |
| | Unknown | 5741 | 265 | 4.62 |

Table 6: Infestation of Red palm weevil in relation to trunk height of date palm

| Sr. No. | Trunk Height (m) | No. of infested palms in the height group | Percent infested in the height group |
|---------|------------------|---|--------------------------------------|
| 1 | 0 - 0.5 | 19 | 12.42 |
| 2 | 0.6 - 1.0 | 55 | 35.95 |
| 3 | 1.1 - 1.5 | 34 | 22.22 |
| 4 | 1.6 - 2.0 | 24 | 15.69 |
| 5 | 2.1 - 2.5 | 11 | 7.19 |
| 6 | 2.6 - 3.0 | 7 | 4.57 |
| 7 | 3.1 - 3.5 | 3 | 1.96 |
| 8 | > 3.5 | 0 | 0.00 |