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ECOLOGICAL, BIOLOGICAL AND CONTROL STUDIES ON PESTS
INFESTING DATE-BUNCHES IN THE NEW VALLEY, U.A.R.

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By

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of date palms during the fruit-bearing season revealed the presence of heavy infestation by the following pests :

Batrachedra amydraula Wcyr. (Momphidae-Lepidoptera) ,
Arenipses sabella Hmp. (Pyralidae-Lepidoptera) , Virachola
livia Klug. (Lycaenidae-Lepidoptera) , Cadre cautella Walk ,
C. calidella Guenec (Pyralidae-Lepidoptera) , Carpophilus
hemipterus L. and C. dimidiatus F. (Nitidulidae-Coleoptera) .
The distribution of most of these pests was found to be general and fairly even all over the area.

The New Valley (Fig. 1) in which this work was carried out lies between latitudes 22° and 27.7 N. and longitudes 25° and 31°, and forms a part of the Western Desert. The total area of the Valley is 6 million feddans but the agricultural land does not exceed 30,000 Feddans, and includes Kharga , Dakhla and Farafra oases. Into the cultivated area, a population of about 50,000 people is concentrated.

The present investigations on means of reducing the crop loss proceeded in three main directions. Part I in this dissertation deals with the biology of Cadre cautella under laboratory conditions. In Part II, discussion was made of certain ecological aspects; the degree of infestation in date bunches and fallen dates and the population dynamics of larvae, the susceptibility of certain types of date fruits to infestation, the effect of tree height on the rate of infestation and

the effect of certain climatic factors on the activity of A.
gabella moths. Part III deals with the agricultural and
mechanical control measures that proved effective in reducing
crop injury and increasing the yield.

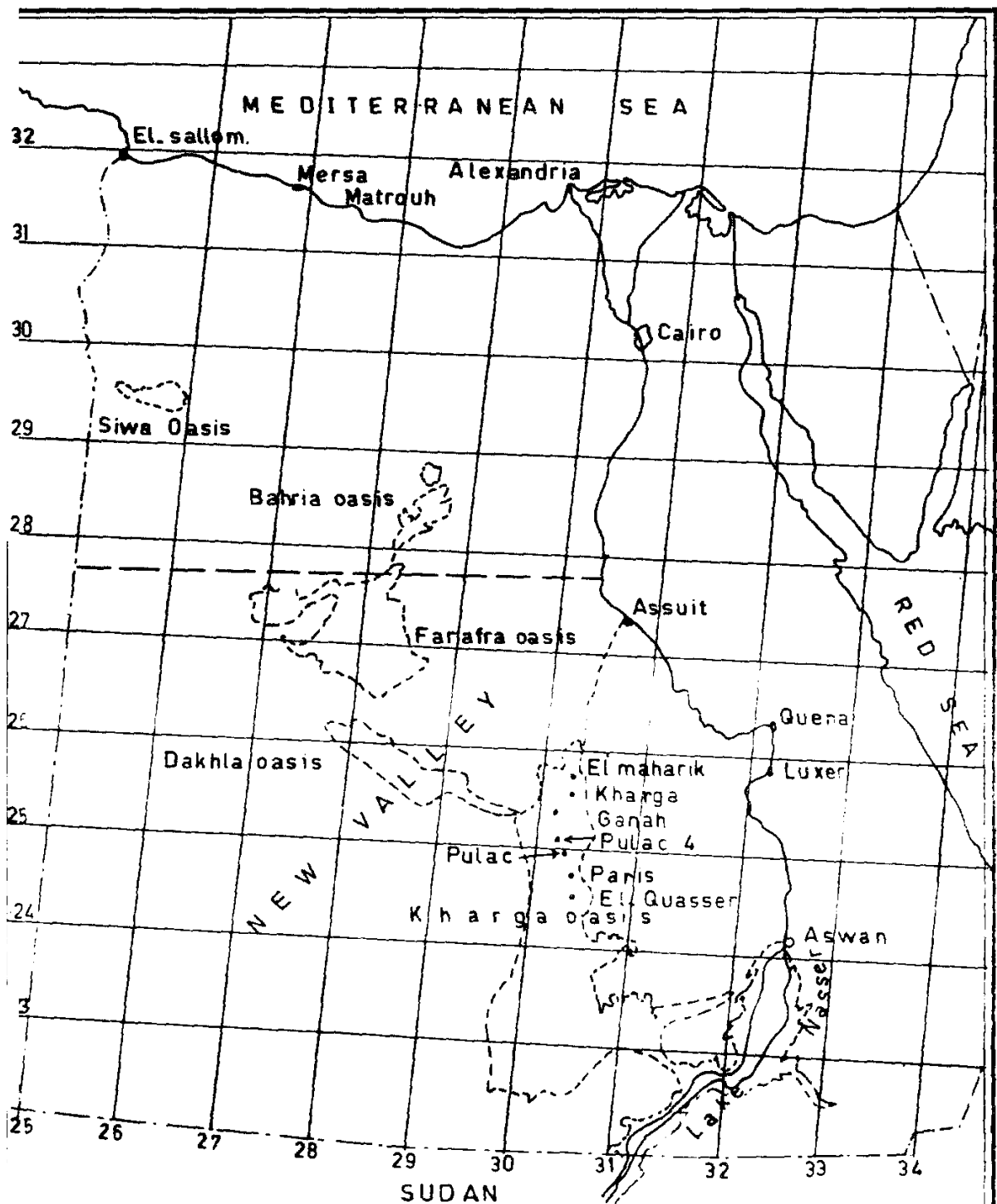


Fig (1). The new valley and the oases of the western desert

REVIEW OF LITERATURE

References with regard to the biology, ecology and control of the insect pests of date palms are very scarce. Most of the work carried out by early workers is no more than mere observations. In recent years however, very few work dealing with this subject is on record. The available review of literature on these pests is cited here under.

1) Batrachedra anydraula Meyr. :

Buxton (1919) stated that a large proportion of the date crop in Mesopotamia (Iraq) was ruined in 1916 by a pyralid moth, which seemed to attack all stages of date fruits and reduced it to the condition known as "hashaf". Larvae were observed to feed on the flesh along the stone in May and June, causing most of the fruits to become red-brown and finally drop. Hibernation occurred in the pupal stage most probably in the ground. The moths emerged in April and May and deposited their eggs either on the female blossoms or on the bunches of young dates soon after they begin to form. He noticed that well watered gardens on which vegetables were raised
x "hashaf" means the drying of young date fruits.

d: with Dutt's suggestion that the dropping of immature date
t: fruits was largely due to lack of fertilization rather than
g: to infestation by B. amydraula.

t: Dutt (1922) observed one generation per year for B.
d: amydraula but did not exclude the possibility of the presence
o: of another generation which might have passed unnoticed. How-
b: ever, two generations per year were recorded for this pest by
Rac 1922 in Iraq. In Libya, Martin (1958) stated that B.
l: amydraula has several generations a year.

t: In his studies on the life history of B. amydraula ,
s: Rac (1922) was unable to detect the hibernation sites of
this pest and thought that any soft part of the trunk of the
palm may be bored into, but cocoons were never found in such
situations. The caterpillars disappeared after the first
week of July; some changed into pupae and emerged as adults
a few days later, others hibernated as quiescent larvae.

In New Zealand, Corbett (1923) observed B. amydraula
attacking flowers of coconuts and young fruits of date palm.
The flowers of the latter suffered great injury by this
pest. Corbett and Tans (1943) stated that B. amydraula was
originally described from India as a pest of stored dried
fruit. Niemann et al. (1955) recorded B. amydraula as the
most injurious pest of young date fruits in Iran.

Gharib (1968) reported E. amydraula as a common pest of date fruits in the south and west of Iran, southern and central parts of Iraq, Egypt and India. Three generations a year were recorded for this pest in Khuzistan, each lasting 60-65 days. Adults of the first generation emerged on mid April when the temperature reached 12-20°C, and this coincided with the beginning of the date fruiting season. Those of the second generation appeared at the end of May. The emerging adults fed on pollen and the females oviposited on the developing fruit clusters and petioles. Each larva damaged on the average 3.5 fruits causing them to fall prematurely. The heaviest attack occurred when the fruits were almost of the same size of a hazelnut, and about 20-70% of the damaged fruits were lost. The third generation which appeared on July at a temperature ranging between 45 and 50°C was less injurious than the first two. Larvae overwintered at the base of the crown or petioles and among the fibres. He noticed that dwarf or young palms and those having a high sugar content were more susceptible to attack.

For the control of E. amydraula, Rao (1922) stated that two applications of a diluted arsenical spray to the bunches at 7-10 day intervals starting a week after fruit setting would kill a high proportion of the wandering larvae which move from one fruit to another before reaching maturity.

Dowson (1964) tested 29 insecticide formulations to control larvae of B. amydraula, A. sabella and the date mite Paratetranychus sp. on date palms. The insecticides tested contained as their main constituents either sulphur, lime-sulphur, selenium, petroleum, derris, pyrethrum, nicotine, sodium hydroxide or derris and sulphur combined. These were applied to trees of about 8 years old at the rate of one gallon per tree for sprays and $\frac{1}{2}$ - 8 oz. per tree for dusts. No treatment controlled B. amydraula completely, but a petroleum oil emulsion applied on April 11th., proved to be the most effective.

Abd El-Mussain (1965) found that one gallon of spray per tree of D.D.T., Malathion and Dipterex at the rate of 500 gm./100 gallons of water or Diazinon at the rate of 300 gm./100 gallon of water proved to be highly effective against B. amydraula. They recommended a first spray with D.D.T. one week after pollination and a second spray with Diazinon, Malathion or Dipterex, 2-3 weeks later. Dowson (1964) claimed for the urgent need to find an effective method to control B. amydraula in Iran.

In an experiment carried out by Gharib (1967) to control larvae of B. amydraula which were active on date palms at the end of May, two applications of Malathion, Ethion or