

THE GASOLINE TORCH TREATMENT OF DATE PALM SCALES

By R. H. FORBES, *Director, Arizona Experiment Station*

Date palms imported from the Old World into Arizona during the past 23 years have been found generally infested with two scale insects, *Parlatoria blanchardi* and *Phaenicococcus marlatti*, commonly known as the Parlatoria and the Marlatt scales. These two scales are very highly specialized in their food habits, subsisting so far as yet known only upon the date palm.

Parlatoria blanchardi infests the outer parts of the tree, including leaf stalks, foliage and fruit. *Phaenicococcus marlatti*, however, shuns exposed situations and is found deeply buried between the overlapping bases of the leaf stalks, only rarely appearing where the insects may be seen without digging into the tree. Occasionally, also, the Marlatt scale may be found upon partially exposed date palm roots.

In devising a method for the extermination of *Parlatoria blanchardi* several years ago the writer, guided by his observation of the Mexican practice of burning date palms to clear them of dead foliage, drenched the trunks of a number of palms with gasoline and set fire to them. The gasoline blast torch was afterwards found to be much more effective, penetrating inward and downward into the spaces between the leaf bases and thus reaching and exterminating the Parlatoria scale. This method has been in use in the Salt River Valley for the last eight years and this treatment, combined with judicious pruning of the older foliage of infested palms, has been found to accomplish the control of *Parlatoria* thoroughly and economically.

The Marlatt scale, however, by reason of its deep seated location in the date palm is not reached and exterminated by a treatment which suffices for *Parlatoria*. However, by cutting the old leaf stubs of the palm clear down to the bole of the tree, thus largely removing infestations of the Marlatt scale, and by then thoroughly burning the exposed bole of the tree with the gasoline torch, this scale may be entirely removed.

The old Egyptian palms on the Experiment Station Farm near Phoenix, Arizona, thus thoroughly pruned down to the boles and burned in 1906, are found at this time (1913) to be entirely free from *Parlatoria* and Marlatt scales. On the basis of these observations the following treatment of infested date palms is recommended, and has been adopted by the Arizona Commission of Agriculture and Horticulture: Destroy *Parlatoria blanchardi* on infested date palms and

their attached suckers by pruning and burning with the gasoline blast torch, as described in Bulletin 56 of the Arizona Agricultural Experiment Station. A year after such treatment, if the tree appears to have been successfully treated, as has proved the case with 90 per cent of those burned in Arizona, the suckers may be cut and transplanted, still infested, however, with Marlatt scale.

When the old tree has ceased bearing suckers it becomes practicable to clean the bole and burn it more thoroughly to eradicate Marlatt scale, the tree or orchard of trees being thus finally freed from both infestations. Transplanted suckers, which at the time of cutting could not have borne the severe burning necessary to deprive them of Marlatt scale, can be followed up in the same way and finally freed of infestation.

SOME RECENT MANUALS OF PARASITOLOGY

By WM. A. RILEY

As a rule the economic entomologist is expected to pass upon all questions of parasitology, whether they relate to insects or other forms. The recently awakened interest in medical entomology has made it more imperative than ever that the student planning to go into work in economic entomology should have a good basis in general parasitology. In this connection, the question as to reliable, up-to-date reference-books and compendia is one that frequently arises, and it has seemed that a brief discussion of some of the available texts, with special reference to the latest, would be of help.

Few of the branches of biological science have made more rapid progress during the past few years than has parasitology, and books which were standard until recently, are no longer satisfactory reference books for even those who are not primarily interested in this field. This is especially true of the very phases of the subject which are most intimately connected with the entomological work.

Leuckart's great classic, "Die menschlichen Parasiten," will never lose its value as a discussion of the biological principles underlying parasitism, but it was written years before the pioneer work on the relations between arthropods and parasitic protozoa were suspected and even the discussion of the vermiform parasites is superseded. Moreover, it is long since out of print and the English translation, by Hoyle, is now seldom offered. The work is of such fundamental value that any opportunity to obtain a copy should be seized.

Of the works on this subject of a more economic bearing, none has been more widely cited and quoted in this country than has Railliet's