*FURTHER OBSERVATIONS ON MITE ATTACKS IN HAPUTALE DURING 1957

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The previous article appearing in the *Tea Quarterly* of March/June 1957 was prepared early in January. These further observations and conclusions cover the period January to September, 1957.

Weather.—Weather conditions during the N. E. monsoon period January to early June followed a more normal pattern than last year. With the exception of a dry spell during the latter part of March and early part of April, rainfall was up to average and well distributed.

The S.W. monsoon period has, however, proved to be the second driest in the past 62 years, the previous lowest rainfall for this period being recorded in 1922.

General Observations.—A carry over of all the four species of mites from the previous year became apparent early in January, and during the dry spell of weather in March a significant build-up occurred. Weather conditions, however, being favourable for quick leaf growth, few instances of defoliation were observed, and crop for the rush season easily surpassed all previous records.

From mid July onwards conditions for the spread of mites became most favourable, and defoliation due to scarlet mite attacks in particular, was being accelerated by the rapid drying out of the soil.

The distribution of the various mites throughout the estate followed much the same pattern as in the previous year, but with a few significant variations.

Scarlet Mite.—Although a few mites were seen on isolated bushes at the highest elevation of the estate—5,700 ft.,—the severity of attack appeared to be less than last year and very little damage occurred above 4,600 ft. Attacks were again most severe in the poorer gravelly areas of the estate; fields in their 2nd and 3rd years suffering the most heavily.

Purple Mite.—This mite has become more widespread, and particularly favours the younger fields. For the first time it has been observed in large numbers in a young field above 5,000 ft.

Yellow Mite.—This is confined to the lower fields, and is most prominent on the younger tea.

Red Spider.—The increase of this spider mite has been most noticeable, and although mainly to be found at a lower elevation, is firmly established in tea of all ages.

Observations on Pest Control Measures.—Mature Tea.—Tea sprayed with both tainting and non-tainting acaricides during 1956 remained comparatively free of the pest until June, 1957, but the severity of attacks is, after about 10 months, now similar to last year before treatment was given.

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Pruned Tea.—Post pruning sulphur treatment was given to one field in August last year, and another field in February of the current year.

In the former field, although no mites were observed in the early part of the year, purple and yellow mites were present in appreciable numbers by June, and scarlet mite attacks developed in July and August.

In the latter field, purple and yellow mites had effected a heavy build-up after 4 months from spraying, but scarlet mite was not noticed until after about 6 months. One acre of this field was left unsprayed as a control, but there is now no visible difference between the mite population of the sprayed or control areas.

As mentioned earlier, the fields sprayed last year again became heavily infested with scarlet mite and purple mite, and a second course of treatment proved necessary.

Control Measures During 1957.—Control measures for scarlet mite were initiated early in March in areas of tea containing a significant mite population, and which had not received any protection the previous year. The scope of this work was restricted as stocks of non-tainting acaricides became exhausted. Fresh stocks did not become available until the end of June, when the programme was continued. By this time, however, the mite population had increased considerably, and at the time of writing, those fields sprayed earlier in the year present a more healthy appearance than fields sprayed during the dry weather.

Dusting.—Experimental dusting over a small area was carried out during March, and a mite count taken in July showed an almost complete absence of scarlet and purple mite, and red spider, whereas leaf samples taken from an adjoining control area showed a heavy infestation of all three species. A further larger dusting experiment is at present in hand, alongside an area receiving spray treatment, leaving an isolated area of tea as a control.

Two types of acaricidal dusts are known to be on the market at the present time, there being a very wide difference between the prices of the two. One dust is priced at Rs. 1/50 per lb. and the other at -/45 cts. per lb. The cheaper material only has been used in the experiment, the cost per acre for a course of treatment of 3 rounds at 30 lbs. dust per acre, approximating closely to that of non-tainting acaricidal spraying, *i.e.* between Rs. 40/- and Rs. 45/- per acre. The use of the more expensive material would result in the prohibitive cost of over Rs. 120/- per acre.

The use of dust for control appears to merit consideration when:

(*a*) water is in insufficient quantity for spraying.

and (*b*) the tea is of such a size and density to preclude the successful manipulation of sprayers and application of the spray.

The application of dust by means of manually operated machines requires a technique similar to that for spraying, each bush receiving individual attention. There is, therefore, little difference between the labour costs of the two forms of control, and unless additional dusting machines are acquired, the normal number to be found on the average estate for use in blister blight control would enable only a very limited acreage to be treated at one time. Power driven dusters are now being tried out elsewhere, but results are not as yet known.

Future Policy.—As a result of observations made during the past 18 months the following points of policy are to be adopted during the coming year. It is emphasised, however, that these conclusions are those thought to be best for this particular estate having an Uva climate, and are not necessarily applicable to other districts.

(a) Pruning.—The present policy of the estate is to prune down approximately 50% of the scheduled acreage between January and March, with a view

to reducing rush crops. The acreage to be selected for early pruning is to be taken from the higher part of the estate, as experience has shown that yellow mite causes no damage at the higher elevation. As this mite is most virulent during the S.W. monsoon period in fields recovering from pruning, the lower fields pruned during the dry weather months, will be recovering into wet weather and should not suffer any set-back from yellow mite damage.

(b) Post-pruning treatment.—Results of past treatment have not come up to expectations, and this work is to be discontinued.

Fewer lungs and maintenance foliage are to be left at the time of pruning where this is thought not to affect the health of the bush; to reduce to a minimum any carry over of mites to newly forming foliage.

(c) Spraying.—No treatment so far given has provided any degree of immunity beyond about 10 months. It now appears inevitable that certain fields will be subject to annual attack and that a routine spraying programme, as for blister blight control, is therefore necessary. The peak period for mite attacks can occur from any time between mid July and the end of September, depending on rainfall distribution, and the date of the start of the N.E. monsoon rains. The optimum time for the application of acaricides appears to be not less than 2 months and not more than 5 months before the time that an attack reaches its peak. It is, therefore, proposed to initiate control measures from about mid March, completing the programme by mid May at the latest. During this period, the blister blight spraying programme is progressively reduced, and with a significant number of sprayers and adequate labour available no difficulty is anticipated in completing the programme.

The acreage estimated for spraying during 1958 comprises all fields in the lower part of the estate with a history of mite attacks, less the acreage scheduled for pruning in this area.

Some Factors Affecting the Incidence and Control of Mite Attacks.—

(a) Weather.—It is known that during a prolonged spell of wet weather, the damage caused by mites is reduced to negligible proportions, even though the mites themselves continue to exist and breed. The physical effect of rain water on the foliage is of lesser importance than the moisture available to the root system, and thence in the form of sap in the leaf. If during dry weather, the loss of moisture in the soil can be reduced to a minimum by the use of thatching material in excess of the amount normally laid down, some diminishment of the damage might be expected.

(b) Chemical factors and/or pH value of the soil.—It has been noticed that certain areas of tea are more severely attacked by mites than others, although there does not appear to be any difference between the water holding property of either area, nor does shade differ appreciably in type or density. This would suggest that either the soil pH value or other chemical property is the influencing factor.

A reference has been found in an agricultural publication of 1928 (1) to the reduction of red spider attacks on tea by the application of sulphur to the soil. It is not, however, clear whether the reduction of red spider was due to the lowering of the soil pH value or to the systemic effect of the sulphur on the mite.

It has, however, been found in another district that whereas the soil pH value is decreasing, the severity of scarlet mite attacks is increasing.

(c) Copper spraying.—Although no direct relation between copper spraying for blister blight control and the recent increase of mites has been found, some connection is thought to exist.

A microscopic examination of village tea where no copper has ever been applied, on the boundary of the estate, has revealed no scarlet mites, though purple and yellow mites were seen. The adjoining area of estate tea which is regularly sprayed with copper, is heavily infested with scarlet mite.

(d) Shade.— Both *Grevillea* and *Albizzia moluccana* are known to be hosts to scarlet mite. If it can be proved that re-infestation of tea in which mites have been eliminated by either spraying or pruning, is due to infested leaf-fall, then consideration might be given to the gradual substitution of *Albizzia sumatrana*, which is resistant to scarlet mite, for the *moluccana* variety. No answer is, however, apparent in the case of the *Grevillea*, and this is too valuable a tree to be lightly discarded. Periodic pollarding followed by bark ring traps might be considered, to prevent any migration to newly formed foliage.

(e) Elevation and Pruning.—As mentioned earlier in these notes, the incidence of attacks by the various mites differs at different elevations. A certain amount of natural control can be afforded in the case of yellow mite by an adjustment of pruning dates.

Reference

1. MANN, H. H. (1935). Tea Soils. Technical Communication No. 32 Imperial Bureau of Soil Science.