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From the combination of two main factors, we can estimate the safe range for bark injury. In the case of light painting (0·6 cc/100 cm²), the safe upper temperature limit is considered normally to be 27°-28°C. so far as the temperature in painting time is concerned. However, as a practical problem, the diurnal change of temperature must be considered, so various further experiments have been carried out. From these experiments I consider that high temperatures continued for a long time after painting are most dangerous, but that high temperatures after cool conditions are not so dangerous as long as the post-painting low temperature continues for some 10 hours or more. This problem can be related to painting time. In the case of morning painting the temperature is not so high at the painting time, but it will be higher in a few hours in general. Therefore, the morning treatment is not always safe. However, it may be said that evening painting is far safer as low temperatures normally follow application.

As a conclusion I recommend "light" painting in the evening to prevent bark injury. Of course, use of diluted emulsion is safer for painting, but I think that the undiluted chemical may also be used under the conditions mentioned above except in mid-summer.

RATIONAL PEST CONTROL, CHEMICAL AND BIOLOGICAL: (1) USE OF NATURAL ENEMIES

INFLUENCE OF PREDATION OF *COCCINELLA SEPTEMPUNCTATA* ON *APHIS FABAE*

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The advantage of coccinellids as natural enemies of aphids is that larvae as well as adults are aphidophagous, and that the coccinellids search for their prey at random. For these reasons they can kill also single aphids right at the beginning of the infestation of fields. And just this critical period is the only possible time when, under certain conditions, the natural enemies can prevent the aphids from the detrimental overpopulation. (As overpopulation develops the natural enemies are no longer of much help.)

Effectiveness of coccinellids in the control of aphids in that critical phase depends partly on their quantity, partly on weather conditions. To clarify this dependence we made two successive field-cage experiments in the years 1963 and 1964.

In 1963 in the critical phase of middle June the weather was much colder than in the analogous period of early June in 1964. During the first 10 days of the experiment in 1963 the average temperature was 16·7° and the average of daily maxima was 21·3°, in the year 1964 the average temperature was 19·5° and the average of daily maxima 26·1°C.

The different temperature had a striking influence on the results. In the colder conditions of the year 1963 at least 1 coccinellid to 30-60 aphids was necessary to prevent them from overpopulating. When 1 beetle came to 100 or more aphids, the coccinellids could not substantially cut back the increase of the population density of the aphids.

On the contrary, in hot conditions of the year 1964 the coccinellids were able to liquidate the infestation of sugar beet by aphids, although at the introduction of the beetles the ratio was of 1 coccinellid to 200 aphids.

We presume that the different issues of the years 1963 and 1964 resulted from the combination of two effects of the higher temperature on the relation between the aphids and predators: favourable for the feeding capacity of the coccinellids, and unfavourable for the reproductive capacity of *Aphis fabae*.