

(a.) If the fungus were perpetuated by ascospores alone, then the destruction of all leaves containing perithecia would prevent primary infection, clean fruit would result, and spraying would be unnecessary. Unfortunately, this would be impossible in orchard practice, as leaves containing large numbers of perithecia commonly occur in such places as under hedges, &c., where they cannot be buried by the plough. Destruction of fallen leaves by hand would be impracticable, owing to the time that this would take and the labour that would be required. Doubtless, infection is minimized by the destruction of a large proportion of the leaves, so that where possible cultural operations should be carried out before ascospore discharge begins in the spring—that is, before September.

Even if the destruction of fallen leaves were practised, infection would still be liable to occur from the conidia developed on infected shoots. The cutting-out of these would not be entirely satisfactory, as this treatment would require a modification of the present lateral system of pruning, and would, moreover, necessitate the examination of every shoot, an operation which would be impracticable in a commercial orchard during pruning operations.

(b.) If ascospore discharge occurred during a short period only, then a single spray application at this time would be all that was necessary to combat this phase of black-spot infection. Unfortunately, spore-discharge occurs over a period of weeks, beginning some time before blossoming and continuing for some time after. Infection does not cease with the completion of ascospore-discharge, but continues throughout the whole of the growing-period and afterwards, occurring even in cool store. Throughout the season conidia are being produced on leaves and fruits, and it is these that cause late infection, as they may be carried by air-currents for long distances. Thus, even an orchard that has been sprayed thoroughly during the blossoming-period is subject to infection from these wind-borne conidia. Spray applications, therefore, are necessary throughout the season to prevent infection. When fruit is to be placed in a cool store a spray application before picking will be of value in preventing infection while in the store.

To summarize: A series of spray applications is necessary, so that the danger period of ascospore infection may be effectively covered, conidia on shoots destroyed, and subsequent development of conidia on leaves and fruits prevented.

CONTROL.

(By J. A. Campbell, Director of the Horticulture Division.)

It has been shown in the foregoing matter that control of black-spot by destruction of infected leaves is impracticable, not only because of the difficulty of destroying all the leaves, but because the danger of infection from diseased shoots still remains. Nevertheless, as destruction of infected leaves would tend to minimize infection by reducing the number of ascospores, it should be practised wherever feasible. It would therefore be advisable to plough deeply in the autumn and dig under all portions left by the plough, thus burying as many leaves as possible. Orchardists are recommended to spray according to the following schedule, which has been found to control this disease effectively in the orchard districts of Auckland, Hastings, and Nelson.