

growth of wheat coleoptile sections and the fact that it was present with its aglycone, naringenin, in dormant peach buds is of physiological interest. Neither the exact concentrations nor the concentration changes of prunin in peach flower buds during dormancy were determined.

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## Drop of Maturing Apples Associated with Bird Feeding<sup>1</sup>

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Further studies of bird damage on apples indicate that fruit dropping as a result of bird activities may be a greater economic loss than feeding damage. Since feeding wounds are caused during the fruit maturation period, the amount of dropped fruit resulting is directly related to two independent factors; first, the inherent ability of the variety to retain its fruit and second, the stage of fruit maturation when damage occurs.

A protective cage was constructed over trees of the apple varieties Cortland, McIntosh and Richared Delicious, to determine the extent of dropped fruit independent of bird activity (Figure 1). Similar type trees, even to the extent of fruit produc-

tion per tree, were used to obtain control data, e.g., fruit feeding and drop damage. The fruit feeding damage that occurred in the control plots was comparable with that which had occurred in previous years (1). Drop damage between the protected and unprotected plots was compared for the 1965 season.

It was assumed that the samples of dropped fruits obtained followed a binomial distribution and that the proportion of the total number of drops in a protected and similar unprotected area could be tested for equality by the  $X^2$  (Chi-square) method of analysis (2). Differences in wind velocities were measured with standard meteorological wind equipment and were found to be negligible from place to place within and without the protective cage. High winds (gusts to 50 mph) occurred during the fruit maturation period but they did not result in a significantly greater fruit drop in the unprotected plots when compared with the protected plots.

More apples dropped sooner in the unprotected plots than in the protected plots during the 37 day maturation period from August 17 to September 23 (Figure 2). The  $X^2$  value was highly significant and since the only ascertainable difference was accessibility of the fruit in the unprotected plots to bird feeding, it is logical to attribute the increased proportion of drops to such activities. Further analysis revealed that significantly greater numbers of fruit dropped from trees of the Cortland and McIntosh varieties than with the Red Delicious variety, however, more feeding damage occurred to the former varieties.

In this study more than twice as

many Cortland and McIntosh apples dropped as a result of bird feeding. While dropped fruit does have salvage value the economic loss resulting from it is obvious. The loss is accentuated in instances when the eventual distribution of the fruit is intended for fresh market channels. Although both the Cortland and McIntosh varieties can be processed, the major share of production in this area is directed to the fresh market.

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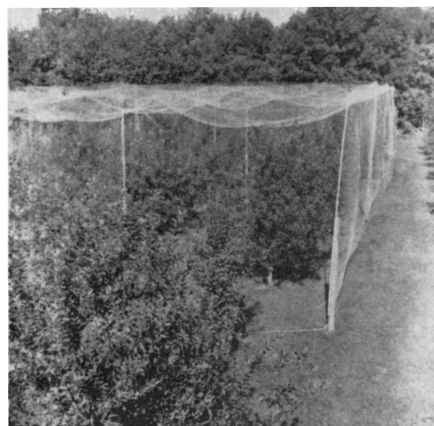


Fig. 1. Protective cage constructed to exclude birds and prevent their feeding activities so that apple drop damage data could be obtained.

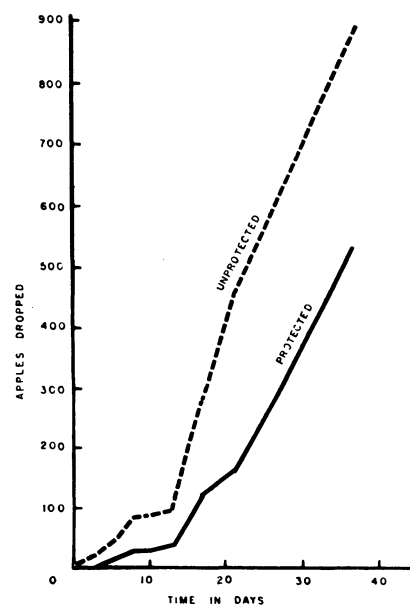


Fig. 2. Cumulative distribution of the number of apples dropped from trees in the protected and unprotected plots during the maturation period of the 1965 season.

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