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## **Pollination of Apple Blossoms**

Prof. J. W. Crow, O.A.C., Guelph abundant supplies of pollen is also use-

Mr. George E. Sanders, B.S.A., carful as an additional means of securing more perfect fertilization. The above is a brief summary of Mr.

Sander's conclusions. These have, I believe, been verified by other investigators and experience also points out the necessity of securing perfect pollination.

With regard to the question whether frost is likely to be more injurious in cases where pollination is delayed through wet weather and lack of insects, I can only say that in seasons such as last spring, when frosts were commonly experienced, the injuries were more serious



#### **Results of Imperfect Fertilization**

The above shows the necessity of perfect pol-lination. Photograph furnished by Prof. Crow, O.A.O.

with those varieties or in those districts where trees were in full bloom. Where fertilization was sufficiently far advanced that fruit could be said to have "set," the fruit remained on the tree and matured, although in many cases apples were disfigured by injuries due to frost experienced in the early stage. With this fact in mind, it would certainly be correct to state that the keeping of bees in orchards is desirable for the purpose of bringing about fertilization at as early a period as possible. Bees, are of course, necessary before pollination can take place at all.

EFFECT OF PERFECT POLLINATION The accompanying illustration shows the results of work done by the writer in following up Mr. Sanders' investigation. Five lots of fifty apple blossoms each were made use of. From one lot (No. 5) four pistils were removed; from the second lot (No. 4) three pistils were removed; from another lot (No. 3) three, and from a fourth lot (No. 2) one pistil was removed. One lot of fifty blossoms was left in normal condition with five pistils, or rather the entire five sections of the pistil in their natural condition. Pollination was performed at the same time and under the same conditions in the case of all five lots of blossoms. The accompanying photograph shows the quantity of fruit produced in each case. It wil be noted at once that the largest number of apples was produced by the normal blossoms and the decrease in productiveness is almost in direct proportion to the number of sections of the pistil removed. On examination, however, it was found that the largest number of good seeds per apple was in the case of lot No. 3. It is not well, of course, to draw conclusions hastily, but in so far as this one experiment can be made use of as pointing towards any definite re sult, it would seem to indicate that a surplus of pollen has the effect of producing fruit regardless of the actual degree of fertilization which may take place. This may or may not be correct, and I wish simply to suggest the question for further investigation. You will note that lots Nos. 1 and 2 have reached considerably larger size than lots Nos. 3 and 4 and 5, and the inference is plain, of course, that thorough pollination influences very materially the size of the fruit. It was also noted in connection with this investigation that the apples of lots No. 1 and 2 were decidedly better in color than those of lots 3, 4 and 5.

In planting I trim off all damaged roots and a few of the longest ones, and cut the stalk down to eighteen inches, leaving four to five good buds to start the head of the tree. I prune regularly, thin out the branches so as to let in lots of daylight, and keep the tree down, so that the fruit can be easily picked. I picked one hundred baskets from eight trees, and could reach every peach from the ground. I cultivate with some hoed crop until such time as the trees need the ground.-L. H. Robinson, Leamington, Ont.

ried on some most interesting investigations in the College orchard in 1905 and 1906. Mr. Sanders defines two distinct conditions which have to do with imperfect setting of fruit. The first is selfsterility, which means that an individual or a variety is incapable of fertilizing its own blossoms even though perfect pollination may take place. The self-sterile varieties when planted in isolated situations or in large blocks do not bear well. The same varieties when planted in mixed orchards may yield abundantly. Some varieties have invariably proven selfsterile, while others consistently prove completely or partially self-sterile. Selfsterile varieties bear as much pollen as self-fertile ones, and the pollen is as good for fertilizing other varieties as is the pollen from a self-fertile sort. The remedy for self-sterility is mixed planting with any variety which bears an abundant supply of pollen and blooms at the same date as the self-sterile variety.

### IMPERFECT FERTILIZATION

This condition may arise even in the case of varieties which are capable of fertilizing their own blossoms, and of course, may also arise in connection with self-sterile fruits even when efficient pollinizers are close by. The indications of imperfect pollination are small, mis-shapen fruits. On examination, onesided apples usually prove to be fertilized only on one side, possessing a small number of well developed seeds. As a rule, cross-pollenized fruit is found to be larger than that self-fertilized. It was noted that imperfectly fertilized fruits are more likely to be attacked by scab on the side on which the seed does not develop than on the fertilized side. Also, it was noted that imperfecty fertilized fruit drops more readily than perfectly fertilized fruit. Thinning of the fruit on the tree causes imperfectly fertilized fruit to stay on better and grow larger than it otherwise would. This is simply because the individual fruits are better nourished than they would be if they were all left on the tree.

#### BEES THE REMEDY

The remedy for imperfect fertilization is the introduction of bees, as it has been clearly proven that insects perform practically all of the work of transferring pollen in the case of tree fruits. The inter-planting of varieties which bear