

Almost all Japanese plums are cross-compatible, provided the flowering periods coincide, though in some exceptions the choice of compatible varieties as pollinators is limited. Some varieties are relatively self fruitful.

Even varieties of fruits which are considered self fertile often set a better crop of fruit if provision is made for cross-pollination. Such provision is a good form of insurance.

In the so-called self-sterile varieties the pollen is not effective on flowers of the same variety and they will not produce seed and carry their fruit properly unless they are cross-pollinated with a suitable variety. The pollen of self-sterile varieties may function satisfactorily on the flowers of other varieties.

No cultivated variety of sweet cherry sets fruit with its own pollen, so they must be cross-pollinated with a compatible variety. Much investigation has been carried out to separate sweet cherry varieties into suitable cross-pollinating groups. Varieties within these groups will not pollinate each other, and plantings must be arranged with varieties from each group closely associated to assure satisfactory setting. When data are complete and available much will be possible to avoid crop failures with cherries.

An attempt is being made at the John Innes Horticultural Institution, England, to breed self-fertile varieties of fruit, but this is a very slow process and many years will elapse before these varieties become available commercially.

Planting a large block of one variety is unwise unless its self fertility is certain. It is preferable to intersperse the varieties at regular intervals. No rule can be laid down, but varieties should perhaps be changed every third row. Some authorities specify that a pollinating variety should be placed at every third tree in every third row as a minimum requirement. However, if an orchard is unduly mixed, difficulties arise because of differences in spraying requirements and harvesting dates of the varieties.

The effectiveness of cross-pollination can be ascertained by hanging flowering laterals from other varieties which flower at the same time in jars of water fairly high up in the trees. Results can then be checked with untreated trees and data secured about both the need for pollination and the compatibility of the varieties tried. If results are satisfactory, permanent pollinators can be budded or grafted on to the trees.



[R. Steele photo.]

To ensure cross-pollination and satisfactory setting of fruit it is advisable to plant different varieties of the same kind of fruit which flower at the same time.

A good pollinator must provide pollen that will germinate well, it must blossom at the same time as the variety to be pollinated, and the varieties must be compatible.

Though English and Japanese plums are not usually compatible, some English plums will pollinate certain Japanese varieties. Some varieties of grapes require cross-pollination.

Work of Bees

The work of the honey bee is the most important factor in the transfer of pollen from blossom to blossom for the fertilisation of deciduous fruits. Wind does not assist in the pollination of most deciduous fruits. Other insects are also believed to assist in pollination, but only to a minor extent compared with honey bees.

Sprays which are poisonous or repellent to bees should not be applied during blossoming, but should be delayed until a stage of blossom fall when there is no danger to the bees. Heavy mortality to bees can be caused by careless spraying, and as a safeguard to the beekeeping industry a regulation under the Apiaries Act prohibits the use of sprays poisonous to bees until almost all the blossoms have fallen from the trees.

A subsequent article by D. Roberts, Apiary Instructor, Department of Agriculture, Auckland, will deal with the use of honey bees in the pollination of orchard fruits.

Soil Nutrients

Nutritional requirements of trees setting fruit are rather complicated. The first growth movement in the tree in spring depends on the nutrients stored

in the tree parts before dormancy was reached in the previous season, but it is important that ample nutrients, particularly nitrogen, be available in the soil to maintain development of this growth satisfactorily during the vital blossoming and fruit-set period. Soil conditions require to be as near perfect as possible at this period, with a good relation between soil moisture, temperature, and nutrients. A deficiency of nitrogen at this time is likely to cause undue dropping of fruitlets. With the development of early-spring growth nitrogen is utilised in fairly large amounts, resulting in a heavy draw on available supplies. If soil conditions and root activity are not satisfactory, the supply to the trees is restricted, though ample nitrogen may be available.

Trees affected by a nitrogen shortage may bloom quite normally, but will not set fruit properly. The young fruits turn yellow or light green soon after petal fall and are quickly shed from the trees. In stoned fruit this usually results in an excessive drop at the beginning of the pit-hardening stage. If nitrogenous fertilisers are used, they must be applied a short time before the flowers begin to open.

The activity of certain micro-organisms in the soil has an important bearing on the supply of nitrogen. If soil conditions are unsatisfactory, the micro-organisms cannot convert nitrogenous matter in the soil to a suitable condition for assimilation by the roots. In these circumstances the addition of nitrogen in the form of nitrates will overcome any shortage which may be caused. The stimulating effect of nitrogen on the roots gives them greater foraging power under dry conditions, as well as sponsoring their early development.