



Squash, Pumpkins, Zucchini & Other Gourds

Cucurbita spp.



Mating & Breeding System

Individual plants bear separate male and female flowers, with many more male flowers usually present. Both male and female flowers produce nectar, but the male nectar has a higher sugar concentration. Flowers of both sexes are typically open for only a single day, from about 4 am to noon when flowers close. Male and insufficiently pollinated female flowers will drop. Insects are required to move large quantities of pollen for fertilization of the numerous ovules within the female flowers. The most successful pollinators are those active in the morning, when the flowers are open and pollen is released.

Pollination, Quality & Yield

Large quantities of pollen must be delivered to a female flower if it is to set a marketable fruit. Cross-pollination also delivers larger individual fruits. Native bees such as bumble bees and the hoary squash bee (*Peponapis pruinosa*: a specialist pollinator of these crops found where cucurbits have been continuously grown) begin foraging earlier in the day than honey bees, when flowers are at their most fertile. While wild pollinators are typically sufficient for fruit set, addition of honey bees can maximize the number of visits per flower, and therefore the size and value of the resulting fruit. If squash bees are present in large numbers, there is little value in adding honey bees, because the former begin foraging in the pre-dawn and the anthers will be stripped of pollen by the time the honeybees begin foraging.

Pollination Recommendations

Cross-pollination can occur between different varieties within the same species of *Cucurbita*, but may lead to undesirable characteristics in the resulting product. Varieties should not be grown near each other, especially if seed is desired for future planting. Wild bee populations, particularly that of the native squash bee (*Peponapis pruinosa*), can be sufficient to pollinate squash and pumpkin on farms managed with pollinator-friendly practices. Care must be taken to avoid damaging the in-ground nests of this bee, particularly during cultivation. Managed honey bees and bumble bees may be superfluous if wild pollinator populations are adequate. However, the addition of honey bees or bumble bees should be considered for larger fields to improve pollination in the center of the field. On hot days shade and water should be provided for the bees. Recommended stocking rates vary from 1-8 colonies per hectare, depending on plant density. Further research is required to determine suitable densities of hive placement.



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