



Watermelon

Citrullus lanatus



Mating & Breeding System

Most watermelon varieties bear both male and female flowers, although a few have male and hermaphrodite flowers. Individual plants are self-fertile, but require a pollinator to bring about pollination, even within a hermaphrodite flower. Seedless watermelon varieties are triploid and produce inviable pollen. They must be interplanted with a diploid pollenizer variety, because successful fruit set requires viable pollen.

Pollination, Quality & Yield

There is a strong correlation between the weight of a mature watermelon and both the number and weight of mature seeds present in the fruit. Seedless watermelon require even more pollinator visits to set marketable fruit, because pollen must be carried from a pollenizer variety further away. Experiments have shown that adding honey bees can increase melon weight and/or number of melons per plot. It has also been found that bumble bee visits produce higher seed set per visit than do honey bees. It is likely that wild pollinators can pollinate commercial watermelon fields, yet if they are lacking then honey bees or commercial bumble bees must be added. Better yields near the margins of large fields than in the centre suggests that wild pollinators nesting in these habitats play an important role in crop development. Growers could improve pollination and reduce costs by encouraging wild pollinators in and around their fields (i.e., reduced mowing, judicious use of pesticides, conserving marginal areas and hedgerows), in addition to using managed pollinators.

Pollination Recommendations

Honey bees remain the pollinator of choice for watermelon, readily providing the large numbers of visits required to set high quality fruit. In larger fields at least, addition of honey bees should be added to improve pollination at a rate of 1-2.5 strong colonies per hectare. Shade and water should be provided for the bees on hot days. Managed bumble bees and the hoary squash bee (*Peponapis pruinosa*) have also been shown to be highly effective pollinators of watermelon. Further investigation of their effectiveness in commercial watermelon production, together with that of other wild solitary bees, is warranted.



Watermelon

Citrullus lanatus



References

- Bodnar, J. 1987. Pollination of vine crops. OMAFRA FactSheet 87-043.
- Dittmar, P.J., Monks, D.W., & Schultheis, J.R. 2010. Use of commercially available pollenizers for optimizing triploid watermelon production. *HortScience* 45:541-545.
- Julier, H.E. & Roulston, T.H. 2009. Wild bee abundance and pollination service in cultivated pumpkins: farm management, nesting behavior and landscape effects. *Journal of Economic Entomology* 102:563-573.
- Kevan, P.G. 1988. Pollination, crops and bees. OMAFRA publication 72.
- Shuler, R.E., Roulston, T.H., & Farris, G.E. 2005. Farming practices influence wild pollinator populations on squash and pumpkin. *Journal of Economic Entomology* 98:790-795.
- Spangler, H.G. & Moffett, J.O. 1979. Pollination of melons in greenhouses. *Gleanings in Bee Culture* 107:17-18.
- Stanghellini, M.S., Ambrose, J.T., & Schultheis, J.R. 1998. Seed production in watermelon: comparison between two commercially available pollinators. *HortScience* 33:28-30.
- Stanghellini, M.S., Ambrose, J.T., & Schultheis, J.R. 2002. Diurnal activity, floral visitation, and pollen deposition by honey bees and bumble bees in field-grown cucumber and watermelon. *Journal of Apicultural Research* 41:27-34.
- Walters, S.A. 2005. Honey bee pollination requirements for triploid watermelon. *HortScience* 40:1268-1270.
- Willis, D.S. & Kevan, P.G. 1995. Foraging dynamics of *Peponapis pruinosa* (Hymenoptera: Anthophoridae) on pumpkin (*Cucurbita pepo*) in southern Ontario. *The Canadian Entomologist* 127:167-175.