



Weeds Enhance Pollinator Diversity and Fruit Yield in Mango

There is an urgent pollinator decline crisis across the globe, with fewer pollinators and yet increasing agricultural reliance on them to produce food and fiber crops for growing populations. Habitat loss and chemical eradication of unwanted plants has limited the floral resources for pollinators, and in farms with only one crop, there are limited resources solely during the flowering season. Weeds, or unwanted vegetation, are often the only remaining floral resource for pollinators, yet they are compulsively removed using chemicals. A recent study examines how weedy floral resources affect pollinators in a mango farm, *Mangifera indica*, a pollinator-dependent crop in South Florida, and how fruit yield is affected by either leaving weeds or removing them.

Cultivated crops are often subject to insect–plant interactions for high yield. There has been a growing interest in environmentally and ecologically sound agriculture using beneficial insects rather than pesticides to produce food and fiber without harmful chemicals in produce and the environment. Ecological intensification is the use of biological regulation to manage agroecosystems at various scales. Natural ecosystems can inspire cropping system designs, and these approaches may have greatest impact in high-input farming systems. Ecological replacement, substituting biodiversity for synthetic inputs, can enhance ecosystem services with similar crop output. The presence of non-crop plants in planted floral strips may be useful in this approach. Weeds may also provide resources that attract and maintain populations of beneficial insects, such as pollinators.

Weeds—wild plants growing where they are not wanted—are seen as detrimental to crop production in agriculture by pulling resources away from the crop. This lack of weeds diminishes beneficial insects through the loss of floral and prey resources. The benefits of using insectary plants in farms is well known; however, using weeds as such in tropical fruit production dependent on pollination is relatively unexplored. Previous work has shown increased success of beneficial insects in the presence of weeds, as these insects use nectar or pollen during their adult life stage to increase life span and fecundity. Pollinator populations may be bolstered in the presence of weeds, and some have been shown to be dependent on them. This study examined how leaving, rather than removing, weeds in a mango farm affected pollinators and fruit set of this popular tropical fruit cultivated in southern Florida.

Pollinators are especially important in crops that require pollination by insects, such as mango, which is known to benefit from the presence of a diversity of weeds. Many tropical crops may be most susceptible to pollination failure from habitat loss. Almost 35% of crops depend on pollinators globally, with pollination of at least 63 crops vulnerable to negative effects of agricultural intensification, which may reduce the diversity and abundance of pollinators. The global annual economic value of insect pollination is upward of USD \$173 billion worldwide. Pollination by bees and other animals increases the size, quality, and stability of yields for 70% of leading economically important crops around the world, including mango. Because native species pollinate many of these crops effectively, conserving habitats for wild pollinators within agricultural landscapes can help promote pollination services for most of the world's crops.

Soil Lovers say: There is a pollinator crisis in areas of intensive human land use and landscape simplification, including farmlands.

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